

Roofing

ANACONDA Economy COPPER ROOFING

*Suggestions for
INSTALLING*



THE AMERICAN BRASS COMPANY

GENERAL OFFICES • WATERBURY, CONNECTICUT

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Anaconda Publication C-7-1 First Edition
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ANACONDA

Economy

COPPER ROOFING

*Installation Suggestions
and Specifications*



THE AMERICAN BRASS COMPANY
GENERAL OFFICES: WATERBURY, CONNECTICUT

ANACONDA *Economy* COPPER ROOFING

IN developing Anaconda Economy Copper Roofing primarily for residences and similar small roof areas, recognition was accorded to the fact that: 1. Standing seam construction for sheet metal roofing had proved both practical and economical; 2. Existing practice resulted in seam spacing too wide for small roofs; 3. The cost of standing seam 16-ounce copper was too high to permit of its widespread use for residential roofing.

Consequently, space between vertical seams was narrowed to $13\frac{3}{4}$ " and the height of the

seams reduced to $\frac{3}{4}$ ". This made possible the use of 10-ounce copper without sacrificing the strength, rigidity and wind resistance obtained from wider, thicker sheets, and at the same time brought the standing seams into the proper architectural scale for small buildings.

The use of lighter metal and its correspondingly greater workability, reduces cost to a point where Anaconda Economy Copper Roofing merits consideration wherever quality roofing is desired.

Why this booklet?

Although the general principles of standing seam construction are well-known to the majority of contractors, we present a series of detail drawings based on proved methods followed by some of the most successful contractors in the field.

Much of the detail presented on the following pages may seem elementary, but it is the purpose of these drawings to illustrate every step in the application of Anaconda Economy Copper Roofing and at the same time to show workable methods of installing a standing seam copper roof without the use of solder.

This latter has been accomplished by taking advantage of the unusual workability of 10-ounce copper and the fact that a fold of several thicknesses is not unduly bulky. All the suggestions offered have been worked out in actual practice with 10-ounce metal and in general the procedures illustrated should also be applicable to 16-ounce copper.

For counsel and guidance, much credit is due the firms of Klein & Kavanagh, Inc., Nicholson & Galloway, and H. Klein and Sons, Inc. The method of presentation was conceived by Vahan Hagopian, A. I. A.

In reading these drawings...

It will be noted that each page details a single operation only, and that steps already covered in previous drawings are not repeated. For this reason, it may become necessary to refer

back to an earlier drawing in order to clarify some operation. Small paper models of the folds illustrated may be helpful in developing progressive details.

GENERAL INSTALLATION NOTES

SLOPE OF ROOF—In sections of the country having considerable snow, Anaconda Economy Copper Roofing should not be applied to slopes of less than 6 inches to the foot. In warm climates, where snow is not a problem, it is usually safe to use standing seam construction on slopes as low as 3 inches per foot. If there is the least question of water backing up over the cross seams, they can be waterproofed with white lead paste or other suitable plastic compounds.

LAYOUT OF ROOF—In cases where the house has some pronounced design feature, such as a main entrance with a section of roof above, or one or more dormer windows, it is usually possible to lay out a roof so that the position of the standing seams will be symmetrical. A little care exercised in determining accurate spacing and arrangement of both vertical and horizontal seams will enhance the beauty of the completed job.

SHEATHING—Boards should be laid solid without open joints, parallel to ridge. All nail heads should be driven home and the entire roof deck covered with 15-pound asphalt saturated felt.

PRINCIPLES OF CONSTRUCTION—No nails penetrate the sheets which are held in place by copper cleats fastened to the roof deck with copper nails. This construction provides for expansion and contraction of the metal due to temperature changes.

Cross section of the standing seam is sim-

ilar to a narrow, inverted V. To provide free lateral movement for the sheets, the seam should be formed with base spacing of at least $\frac{1}{16}$ ".

Undue bulkiness at complicated seams is avoided by trimming the sheets as indicated in several of the drawings.

VALLEYS AND FLASHINGS—16-ounce copper is suggested for valleys and flashings because they are subjected to greater wear than the roof proper. In many instances however, the same 10-ounce copper as used for the roofing should give satisfactory results, but this procedure should be followed only after full consideration of the local conditions applying to each case.

SIZE AND WEIGHT DATA—Economy Copper Roofing is furnished in strips of 10-ounce copper, 16 inches wide and 6 feet long, packed flat in cases containing sufficient copper (48 sheets) to cover 3 squares of roof area. Weight of copper—approximately 240 pounds (80 pounds per square).

TOOLS AND EQUIPMENT—The same tools and shop equipment regularly used for standing seam roofing are employed for forming and applying Economy Copper Roofing. Pairs of double seamers (kickers) are available for $\frac{3}{4}$ " as well as for 1" finished standing seams. If a pair of 1" seamers is already on hand, only one additional seamer ($\frac{3}{4}$ ") is required to make the finished $\frac{3}{4}$ " standing seam.

SUGGESTED SPECIFICATIONS

10-OZ. ECONOMY COPPER ROOFING

PREPARATION OF SURFACE

The roof boarding is to be laid solid without open joints and should be thoroughly inspected. All nails are to be driven home and imperfections in the boarding are to be repaired.

FELT LINING

Furnish and apply a 15-pound asphalt saturated lining felt over the entire roof area before applying the copper. This is to be done in the usual manner, weather-lapping the edges at least 2 inches, and nailing with flat head copper roofing nails.

COPPER

The roofing material is to be Anaconda 10-ounce Economy Copper Roofing, and shall be supplied in sheets 16" x 72", with parallel edges and square ends.

SYSTEM OF CONSTRUCTION

The Economy Copper Roofing is to be applied according to the installation methods suggested in The American Brass Company's Publication C-7-I, or as approved by the architect, following the conventional standing seam system of construction, with the use of standard roofing tools which are made for the purpose. The seam spacing is to be laid out by means of chalk lines on the roof surface, centered so as to give an equal spacing at the ends, and must be approved by the Architect before the work is begun.

The roofing is to be installed without the use of solder, except in unusual instances where soldering is absolutely necessary to make flashing joints watertight.

The work of applying the copper roofing shall begin by fastening a copper edging strip to the roof at the eaves and verge (as shown by detail).

The copper roof pans are to have a 1 1/4" upstanding edge on one side and a 1-inch upstanding edge on the opposite side, these edges to be double locked with seaming tools to make a 3/4-inch high finished seam with base

SUGGESTED SPECIFICATIONS—Continued

spacing of at least $\frac{1}{16}$ ". The end joints of the 72-inch pans are to consist of $\frac{3}{4}$ -inch flat lock seams *without solder*.

The standing seams at the eaves and valleys, and as they approach a hip or ridge, are to be finished as shown by the details.

VALLEYS

The valleys are to be 16-ounce (or 10-ounce) Anaconda Copper. They shall have $\frac{3}{4}$ " edges turned back on each side. The end joints are to be made with at least 1" seams. They, as well as the joints with the roof pans, are to be single flat locks, *without solder*.

FLASHING

Flash with 16-ounce (or 10-ounce) copper against all vertical surfaces, extending the flashings upward at least 4 inches. Where the flashing is against masonry, a copper counter flashing is to be installed with a 4-inch vertical face, as shown by detail or as approved by the architect.

FASTENING

The edging strips are to be of lengths not exceeding 8 feet and they are to be installed with a $\frac{1}{16}$ " clearance between the strips. The strips are to be fastened by solid nailing at intervals of 4 inches or less. The roof pans, valleys, etc., are to be fastened by means of $2\frac{1}{2}$ " x $2\frac{3}{4}$ " 10-ounce copper cleats spaced not over 12 inches apart along each edge or seam, using two copper nails to each cleat, the end of the cleat folded over to cover the nail heads.

NAILS

For all fastening of copper, $\frac{7}{8}$ " No. 14 flat head copper roofing nails are to be used.

MISCELLANEOUS

In general, the standing seams are to be rolled or locked in a right-hand direction, excepting at the valleys, where all seams are to be rolled away from the flow of water in the valley.

Specifications for copper gutters, leaders and accessories can best be written to suit each particular job by referring to catalogs issued by manufacturers of those materials.

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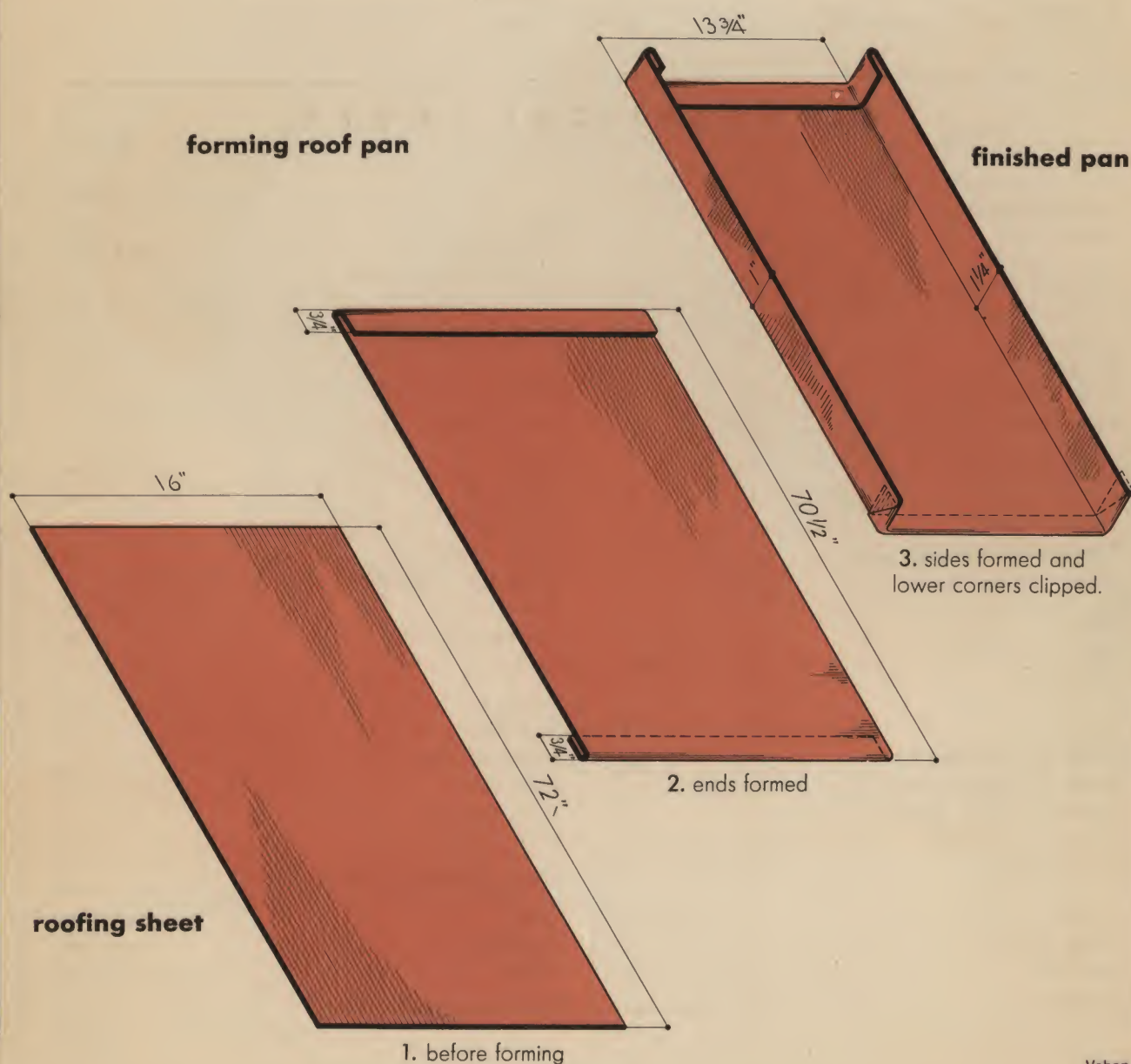
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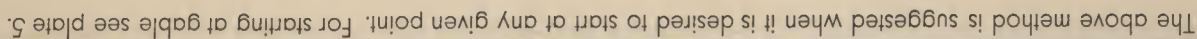
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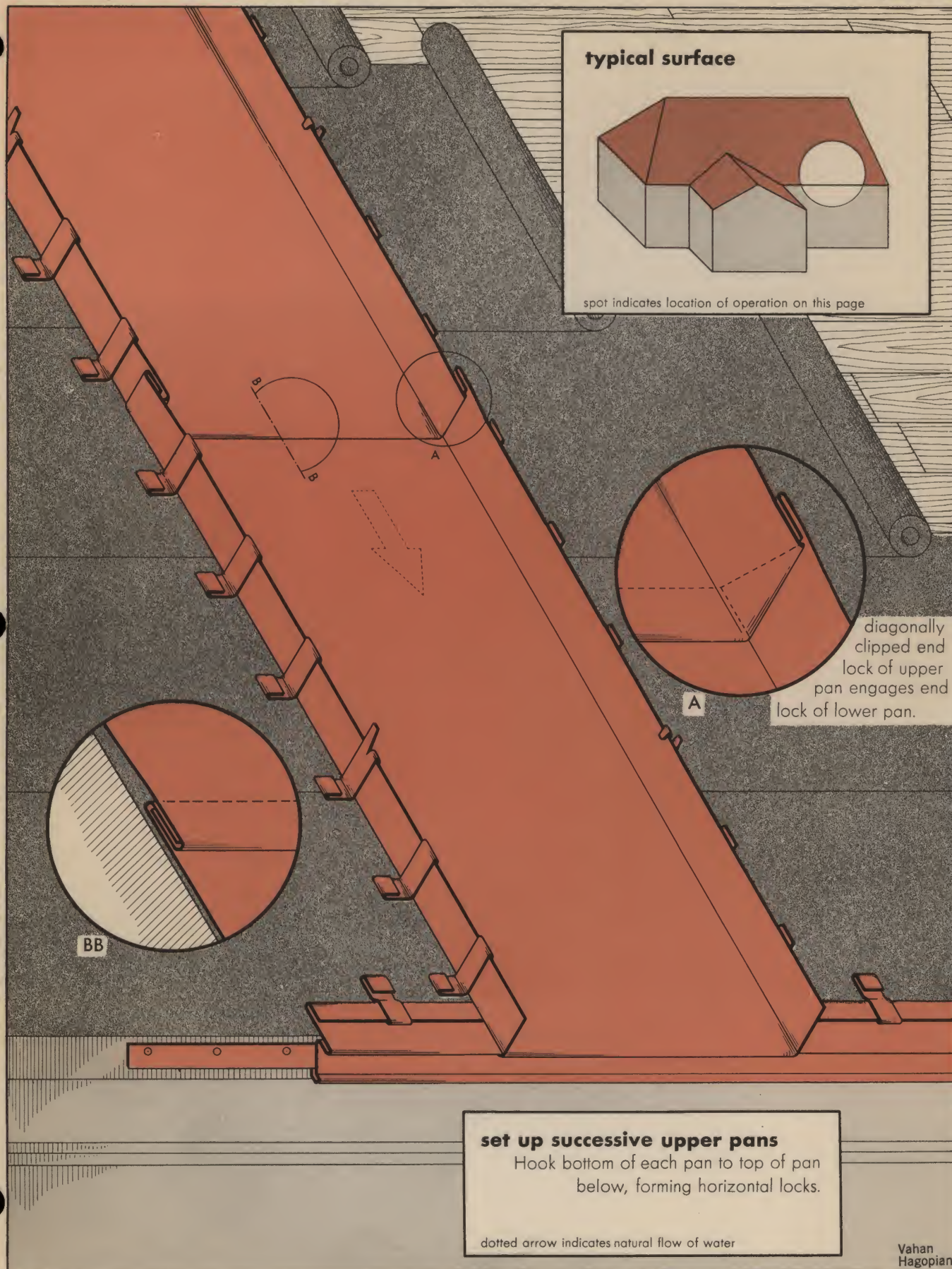
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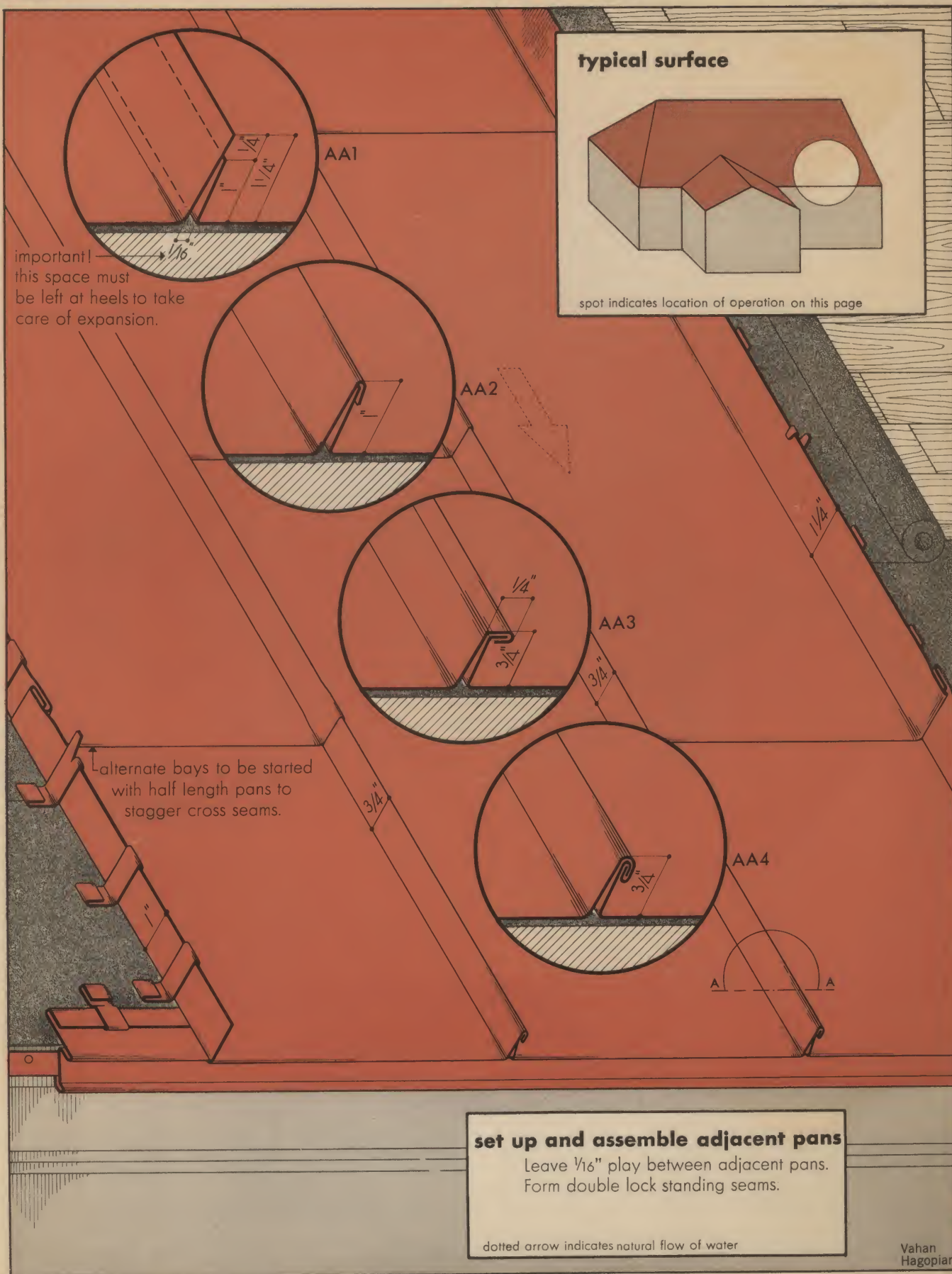
Successive Steps in Laying Economy Copper Roofing *by the Pan Method*

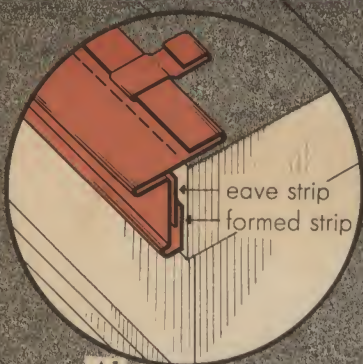
ROLL METHOD IS ILLUSTRATED STARTING AT PLATE 56



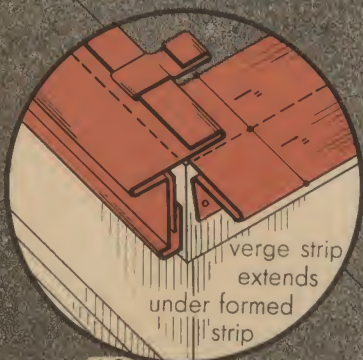




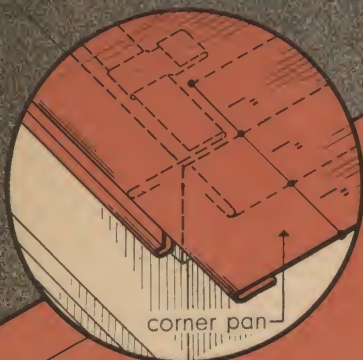




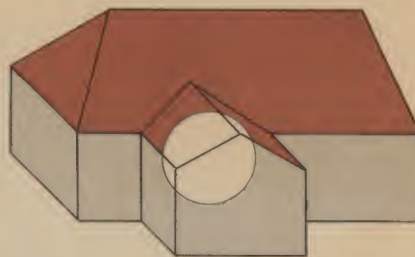
A1



A2



A3

gable and ridge

spot indicates location of operation on this page

verge strip

gable line

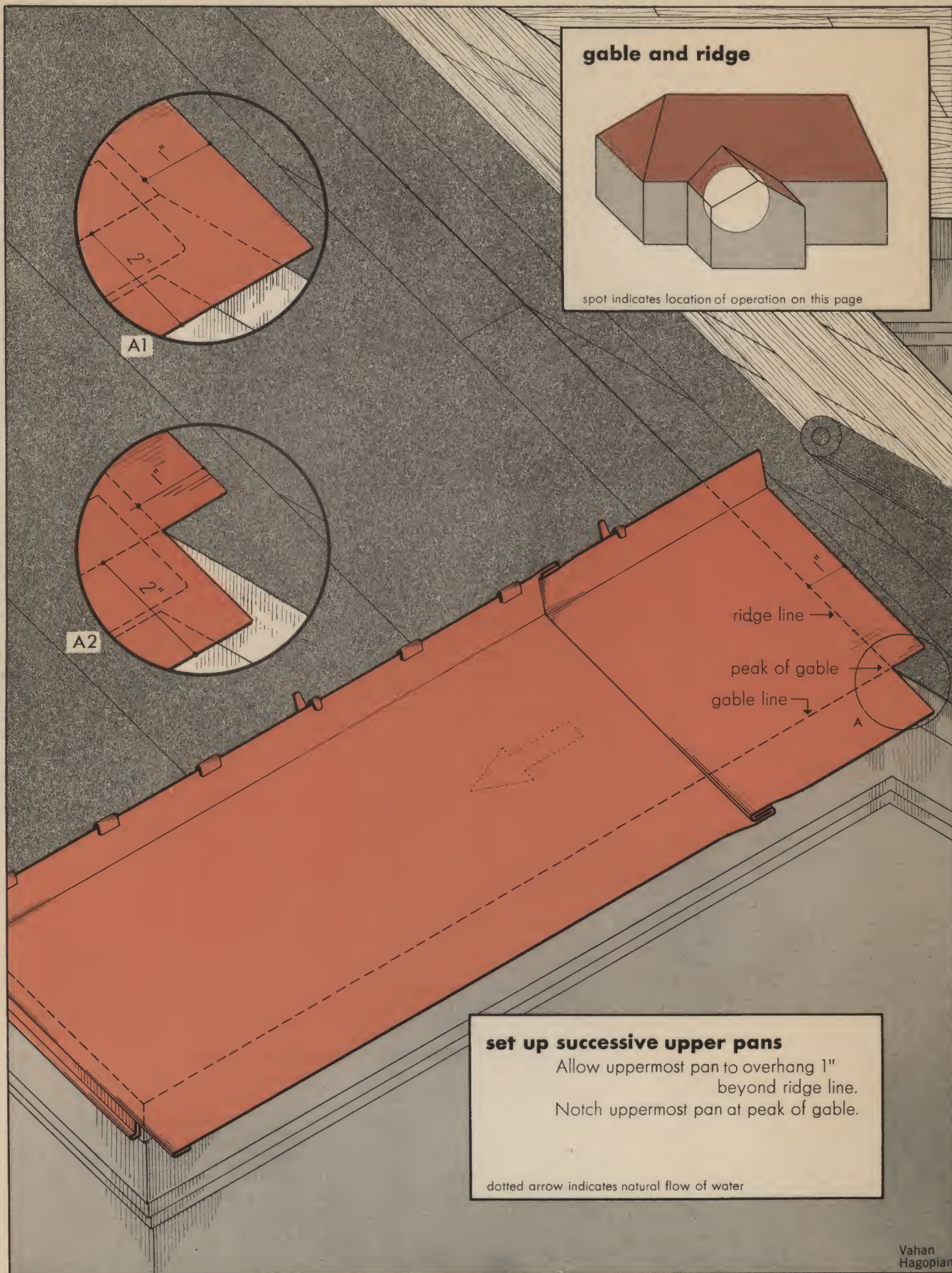
eave line

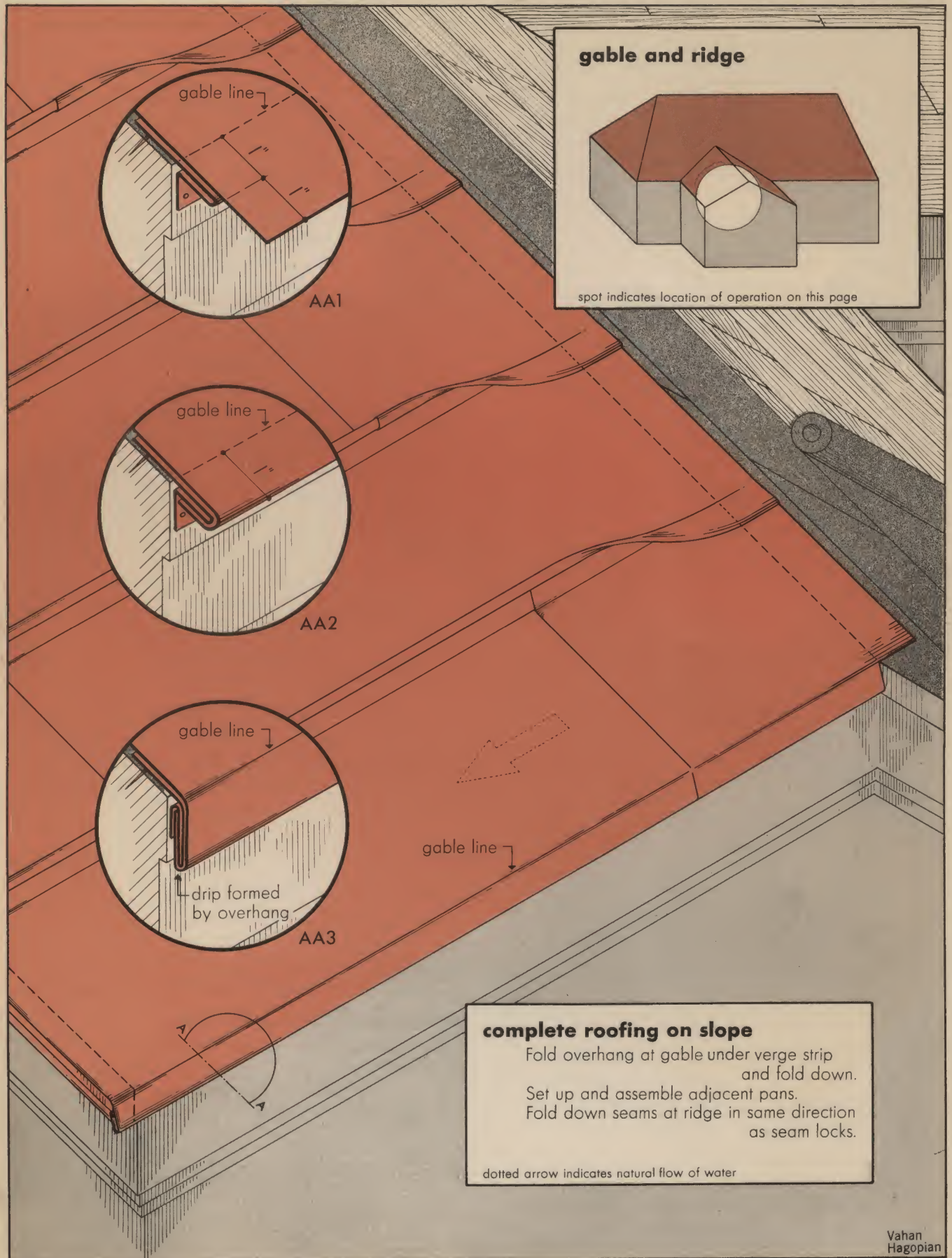
2"

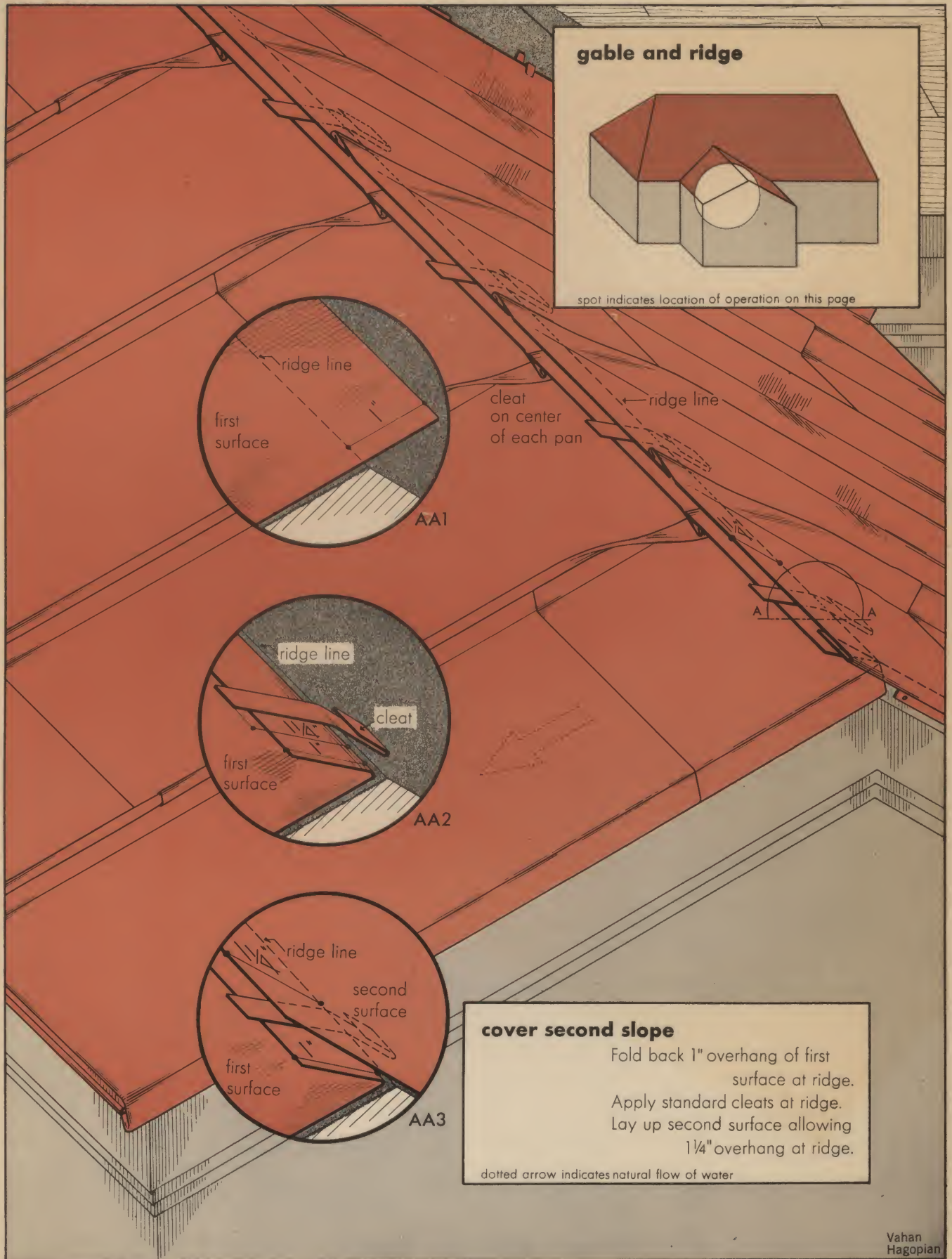
set up corner pan

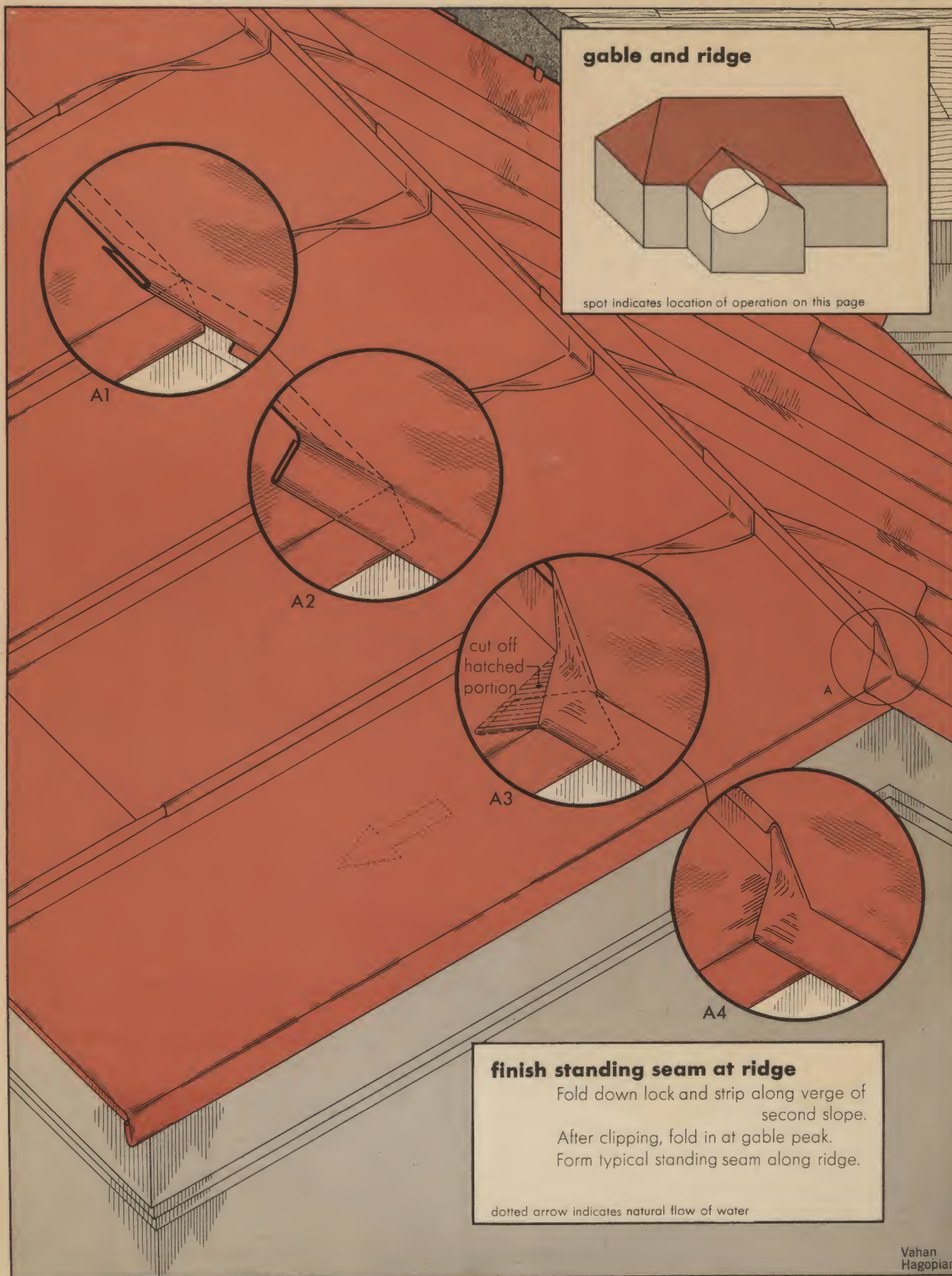
Apply eave strip and formed strip.
 Nail verge strip with copper nails every 6"
 along verge of gable allowing
 overhang of 1" beyond gable line.
 Hook corner pan to formed strip.
 Allow overhang of 2" beyond gable line.

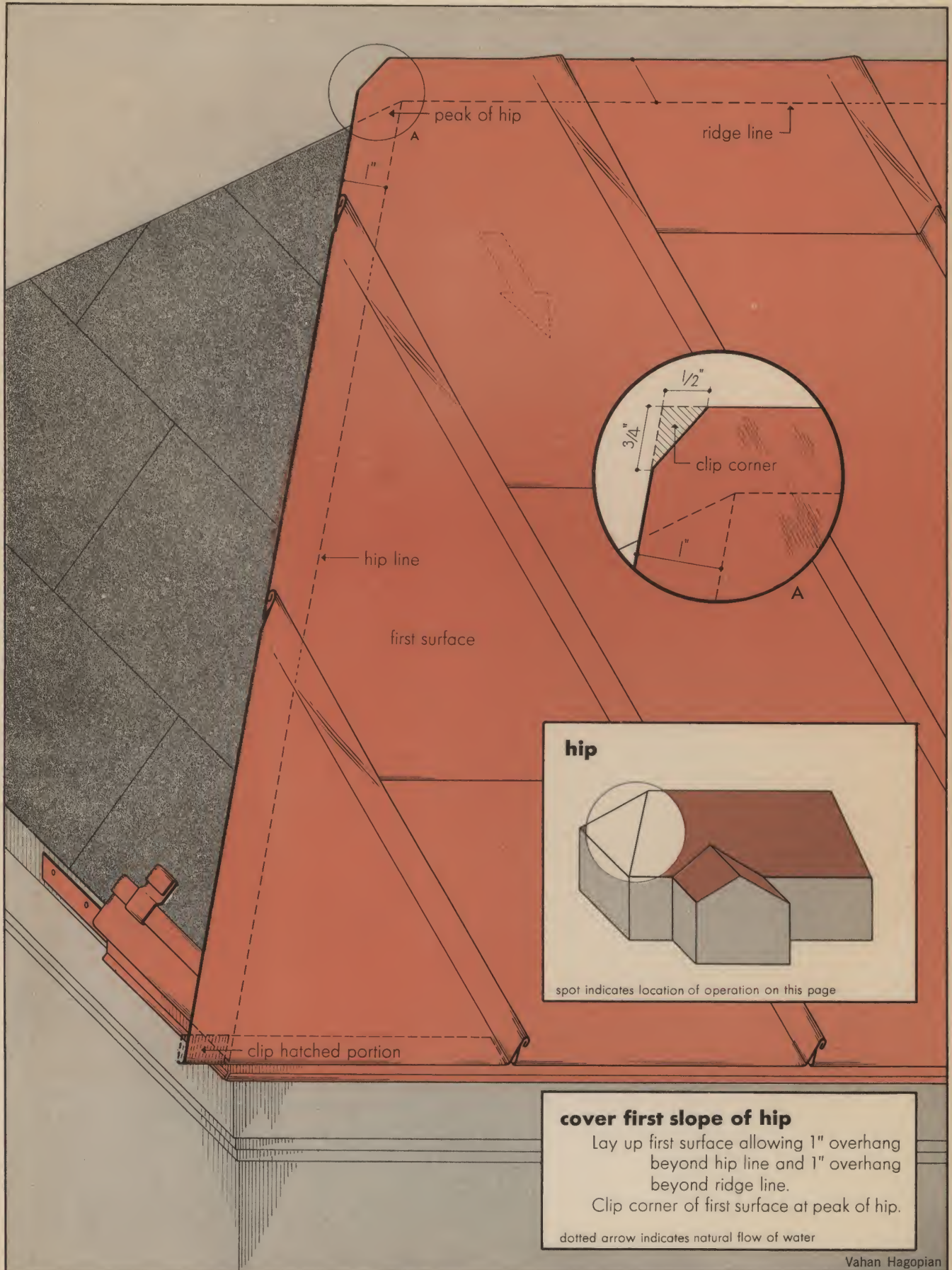
dotted arrow indicates natural flow of water

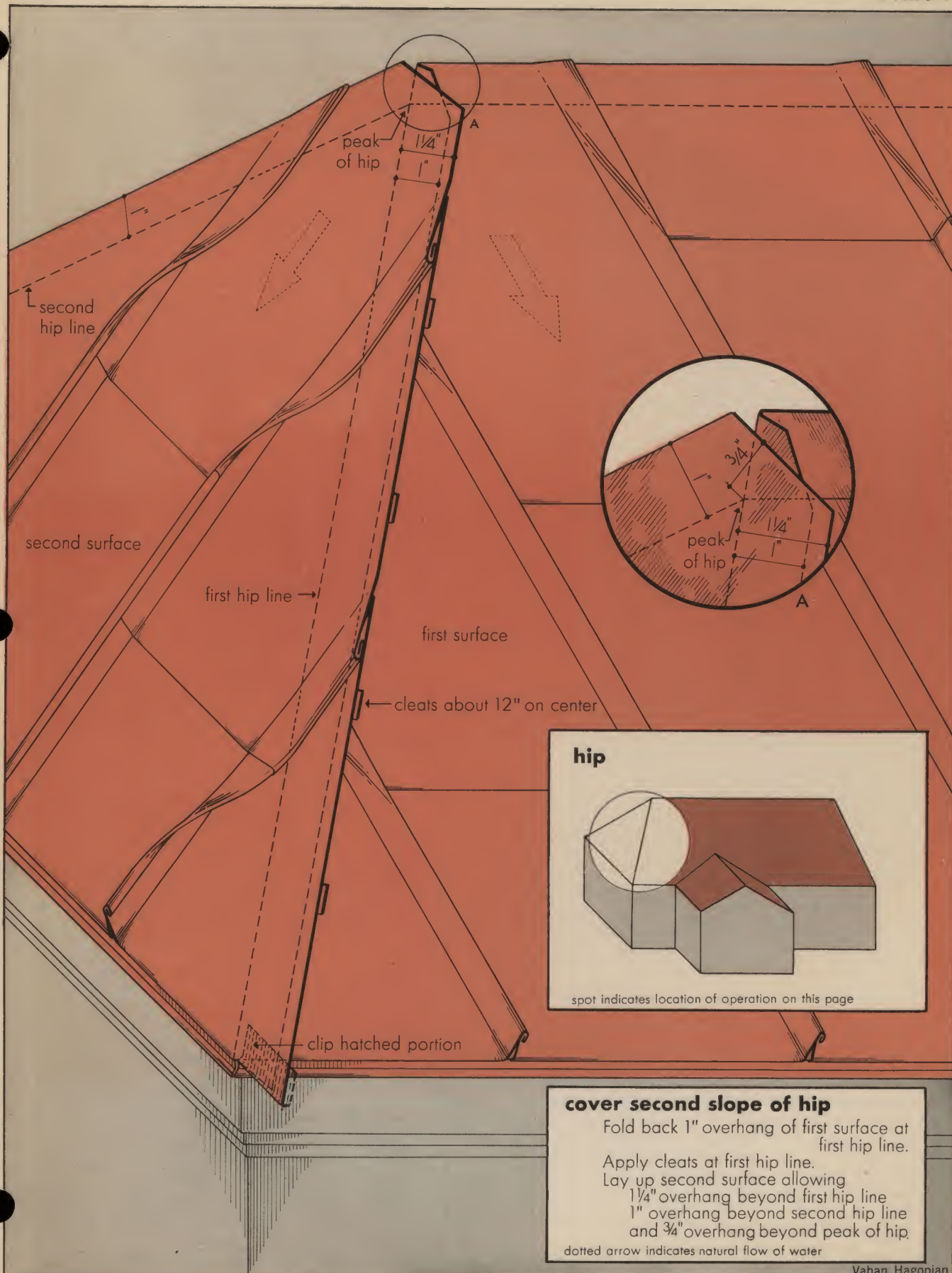


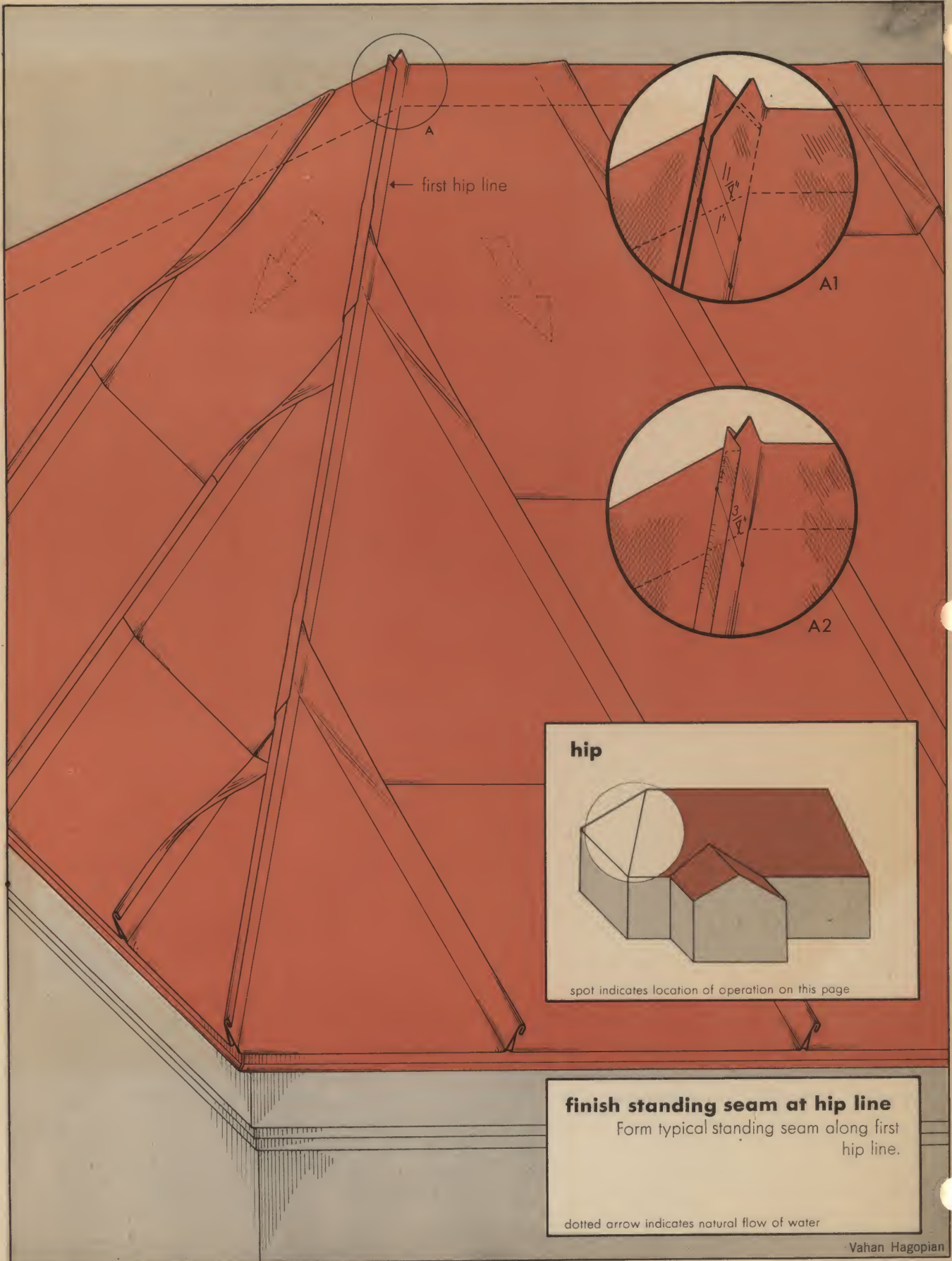


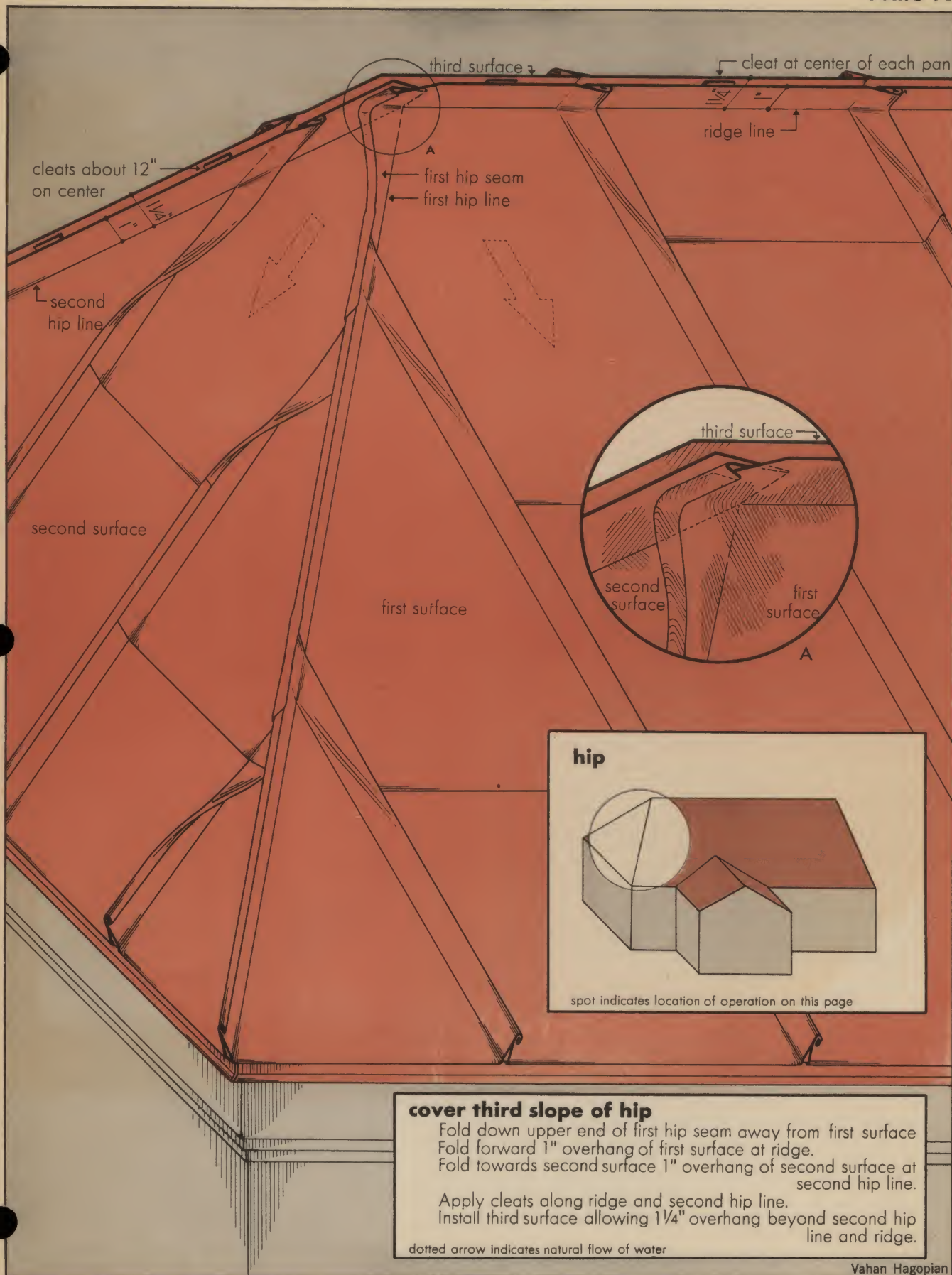


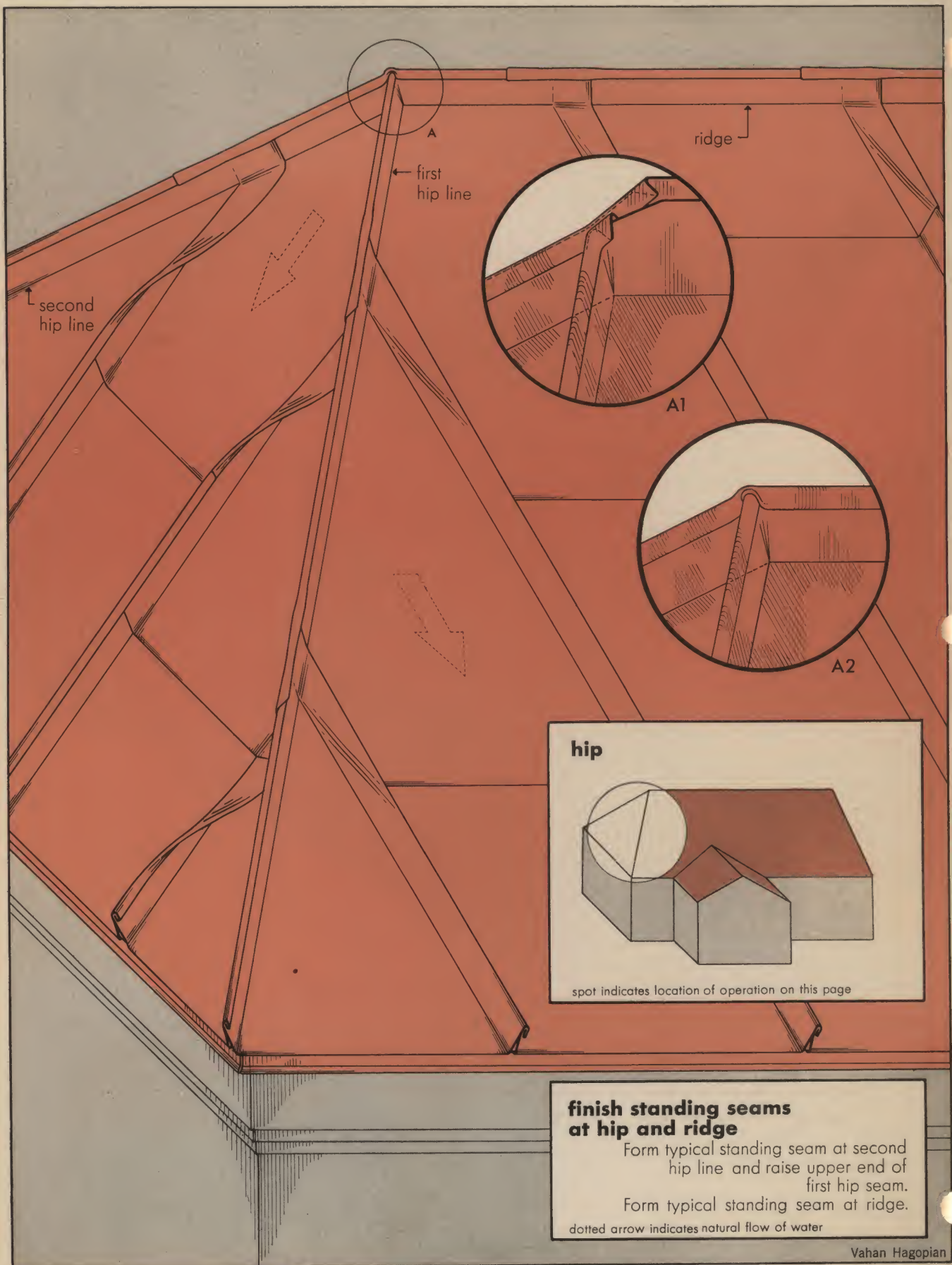










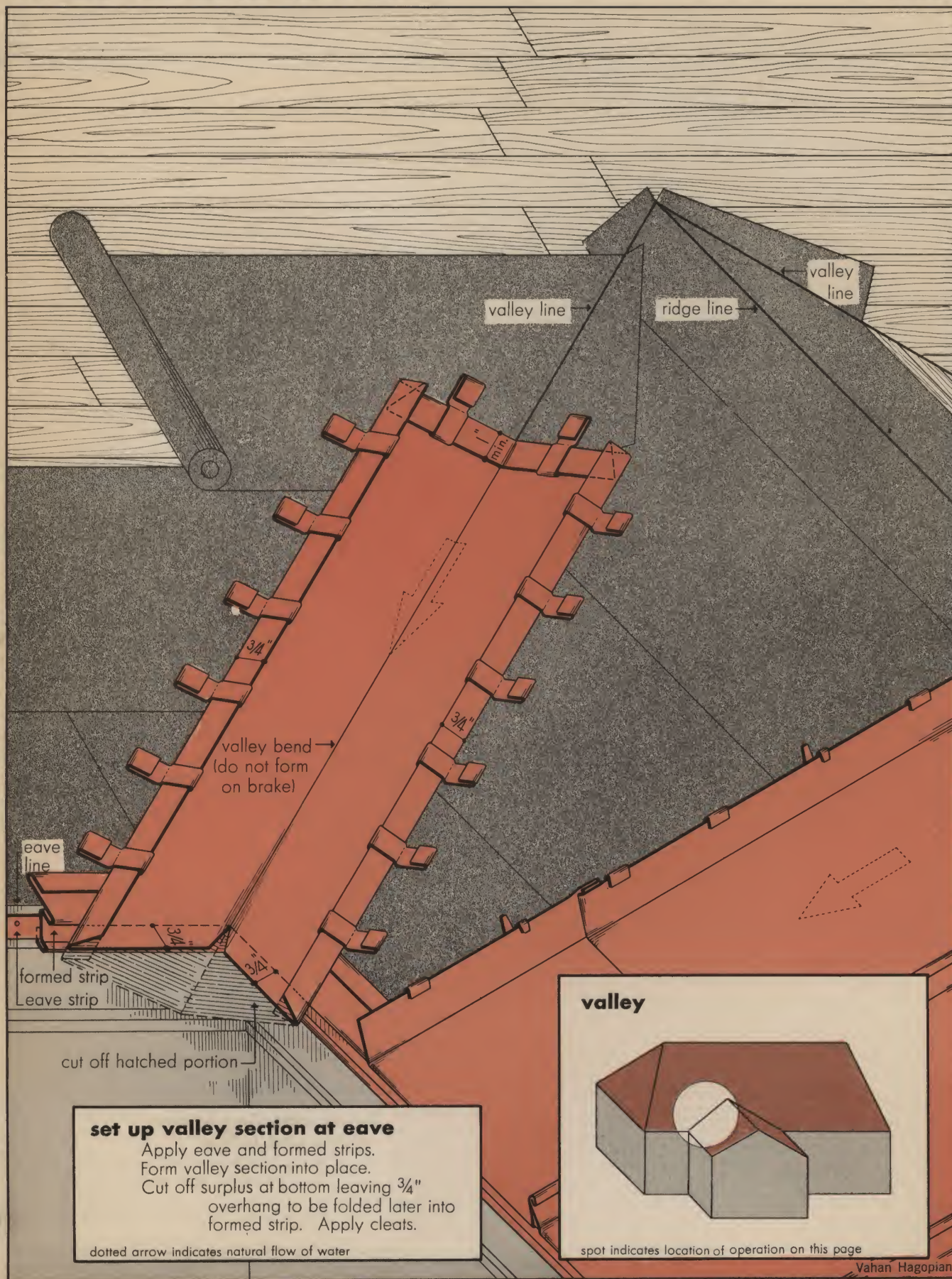


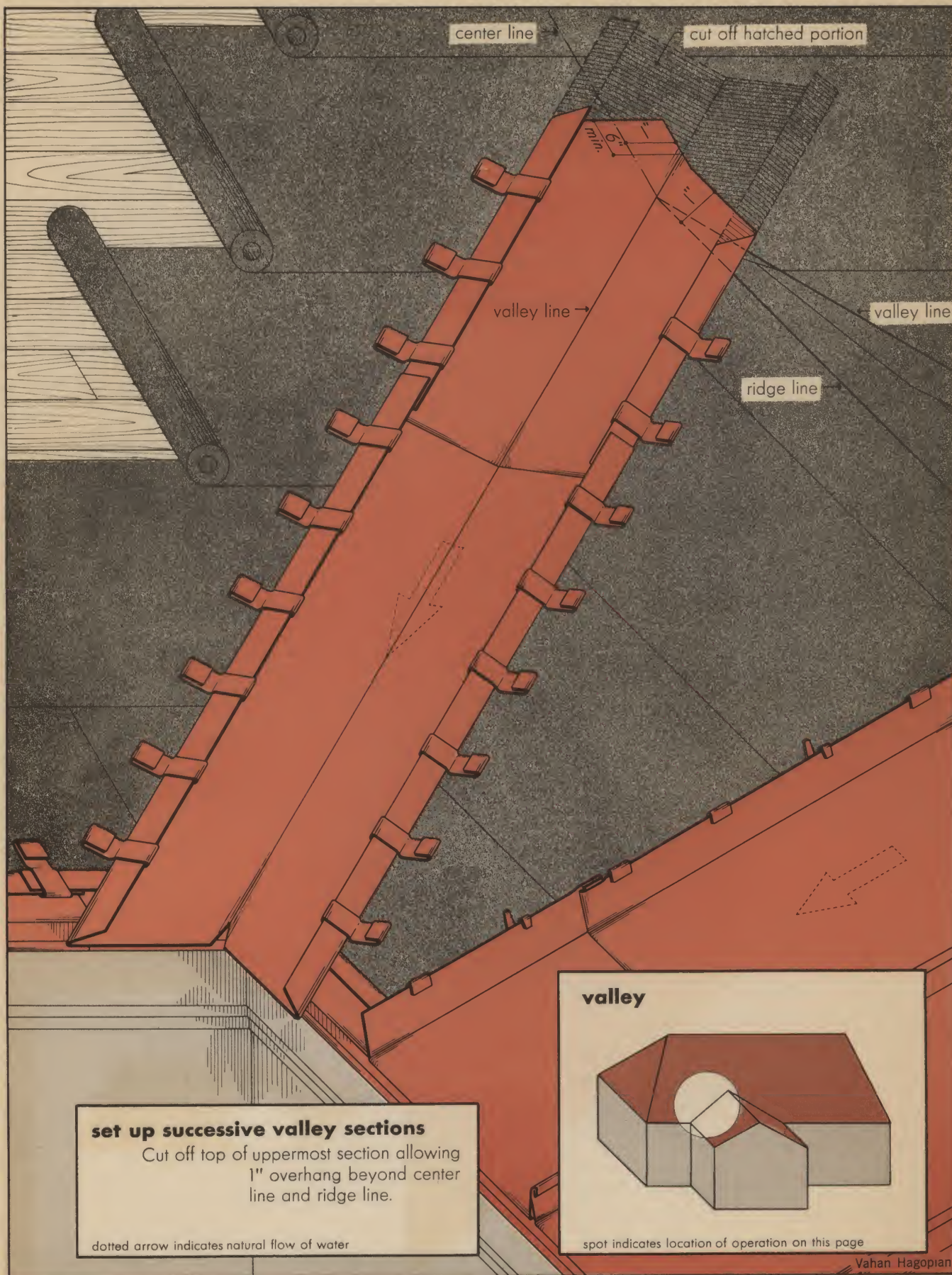
**finish standing seams
at hip and ridge**

Form typical standing seam at second
hip line and raise upper end of
first hip seam.

Form typical standing seam at ridge.

dotted arrow indicates natural flow of water

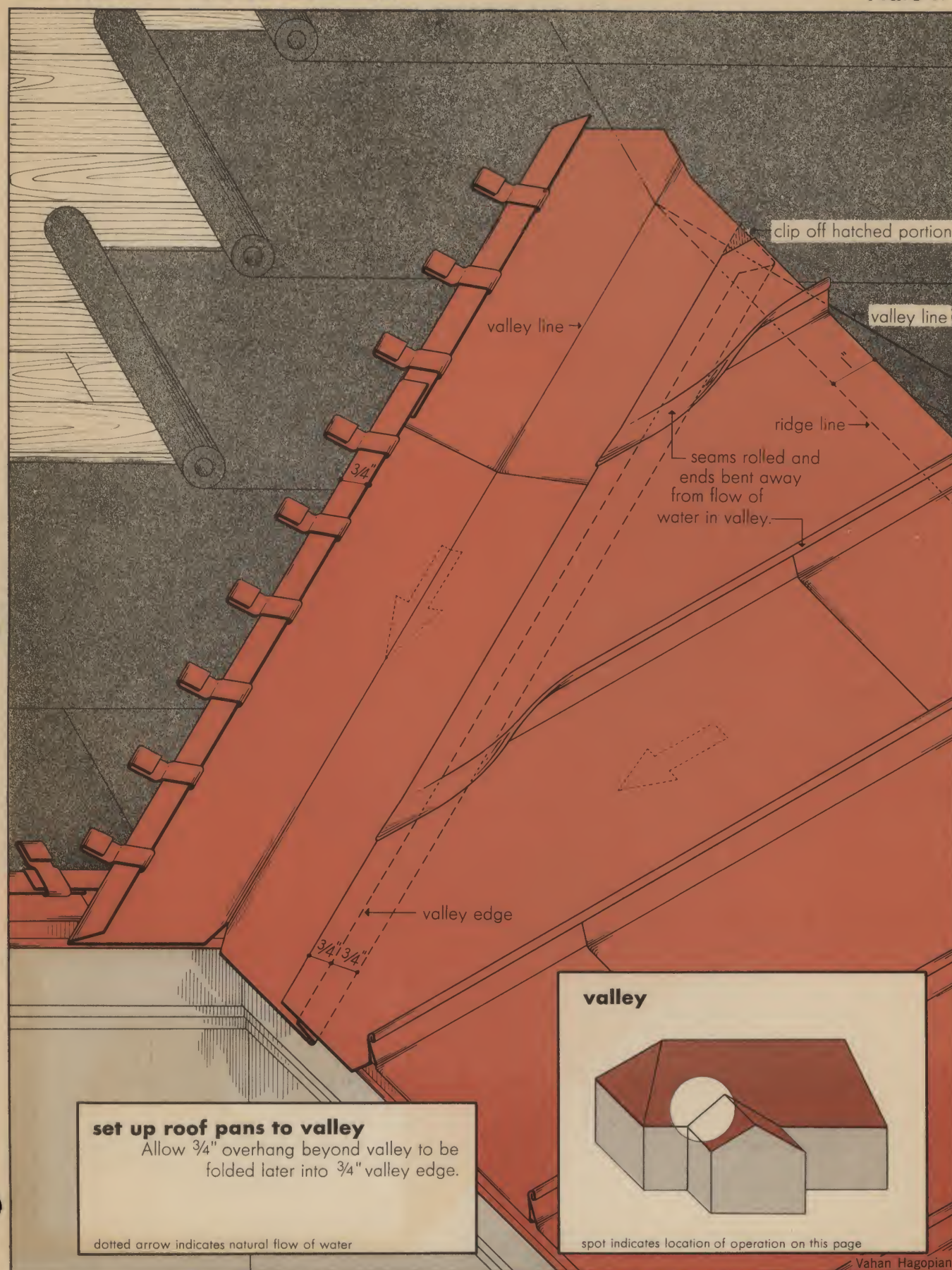


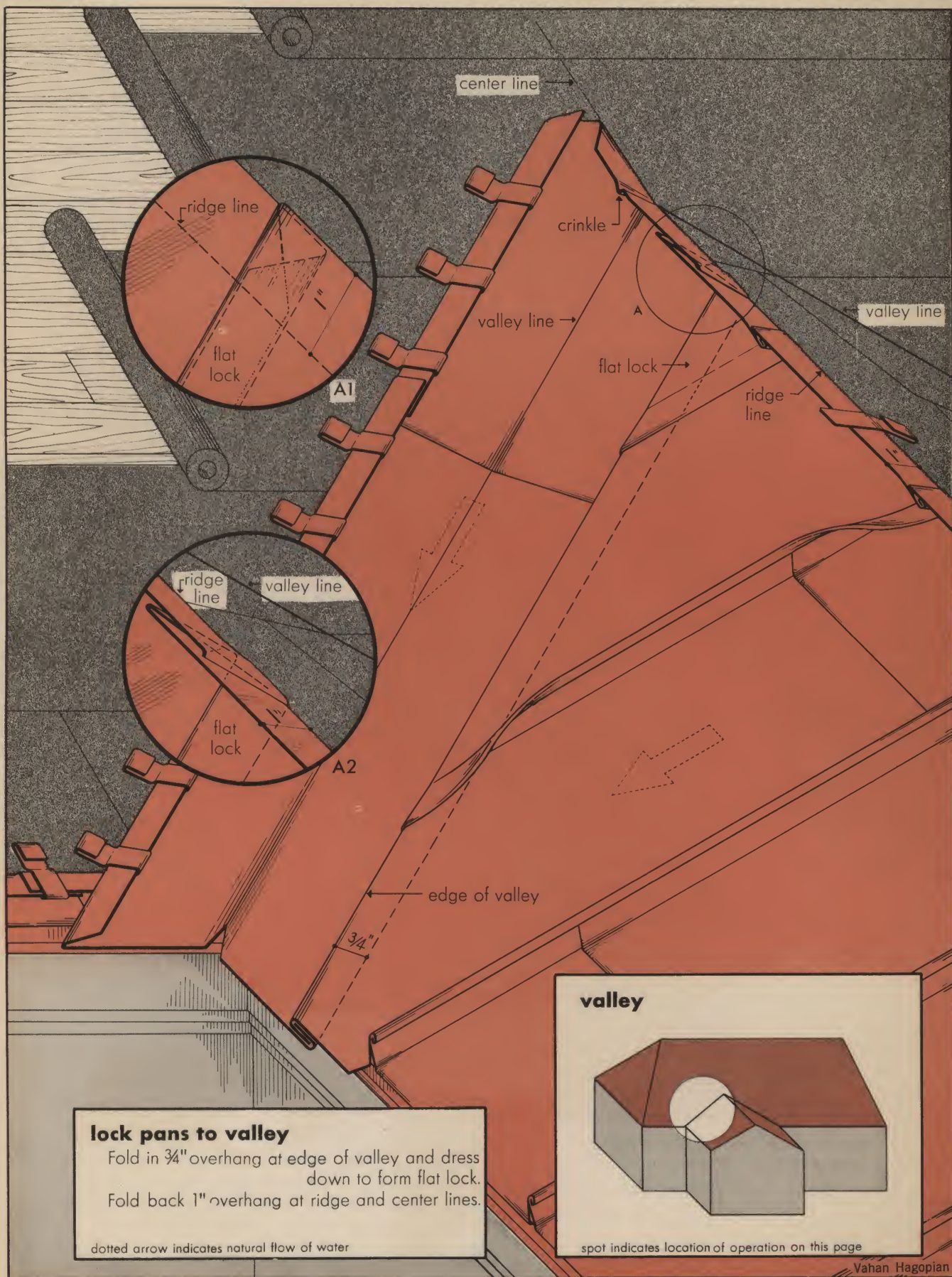


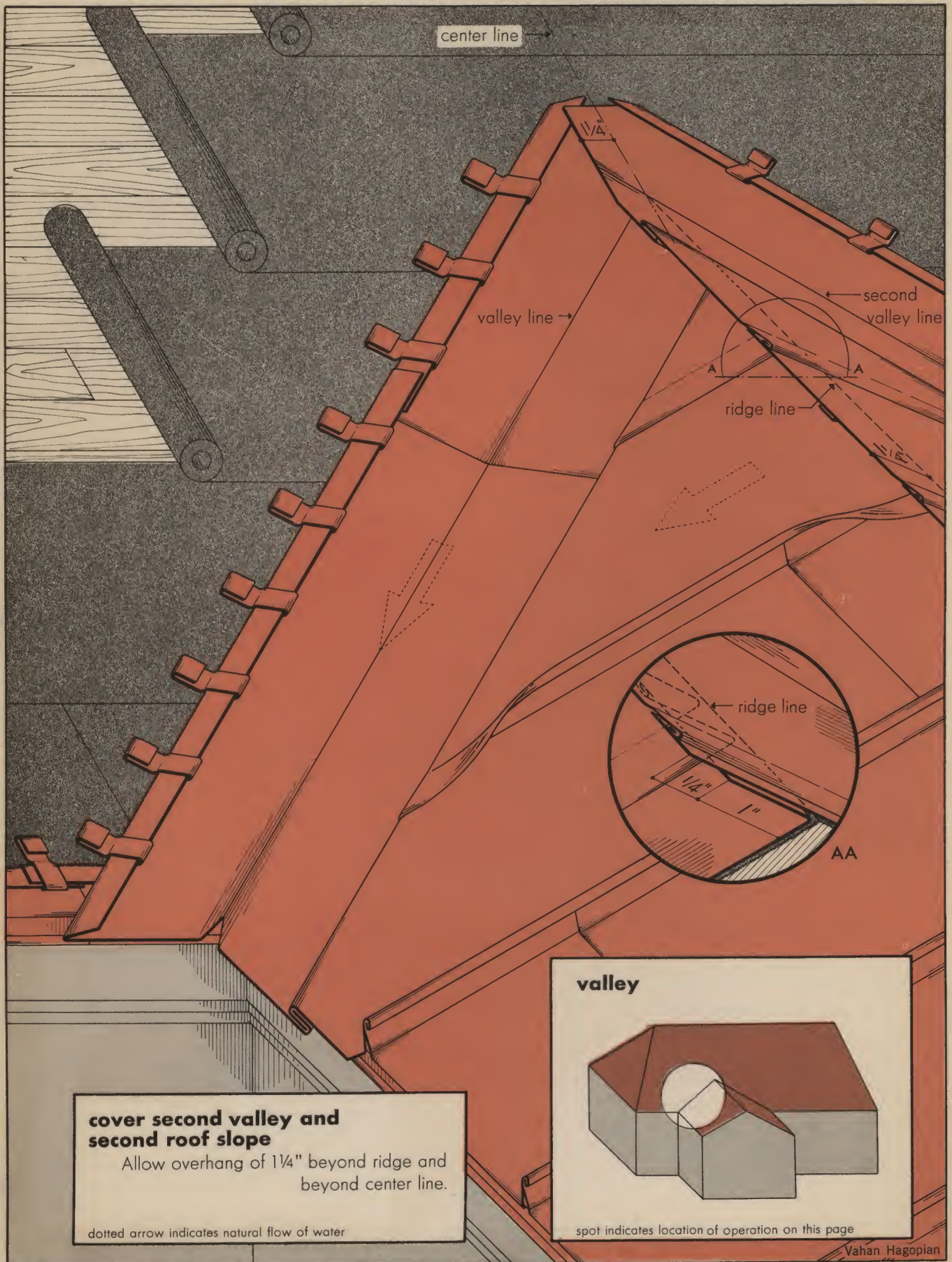
set up successive valley sections

Cut off top of uppermost section allowing 1" overhang beyond center line and ridge line.

dotted arrow indicates natural flow of water



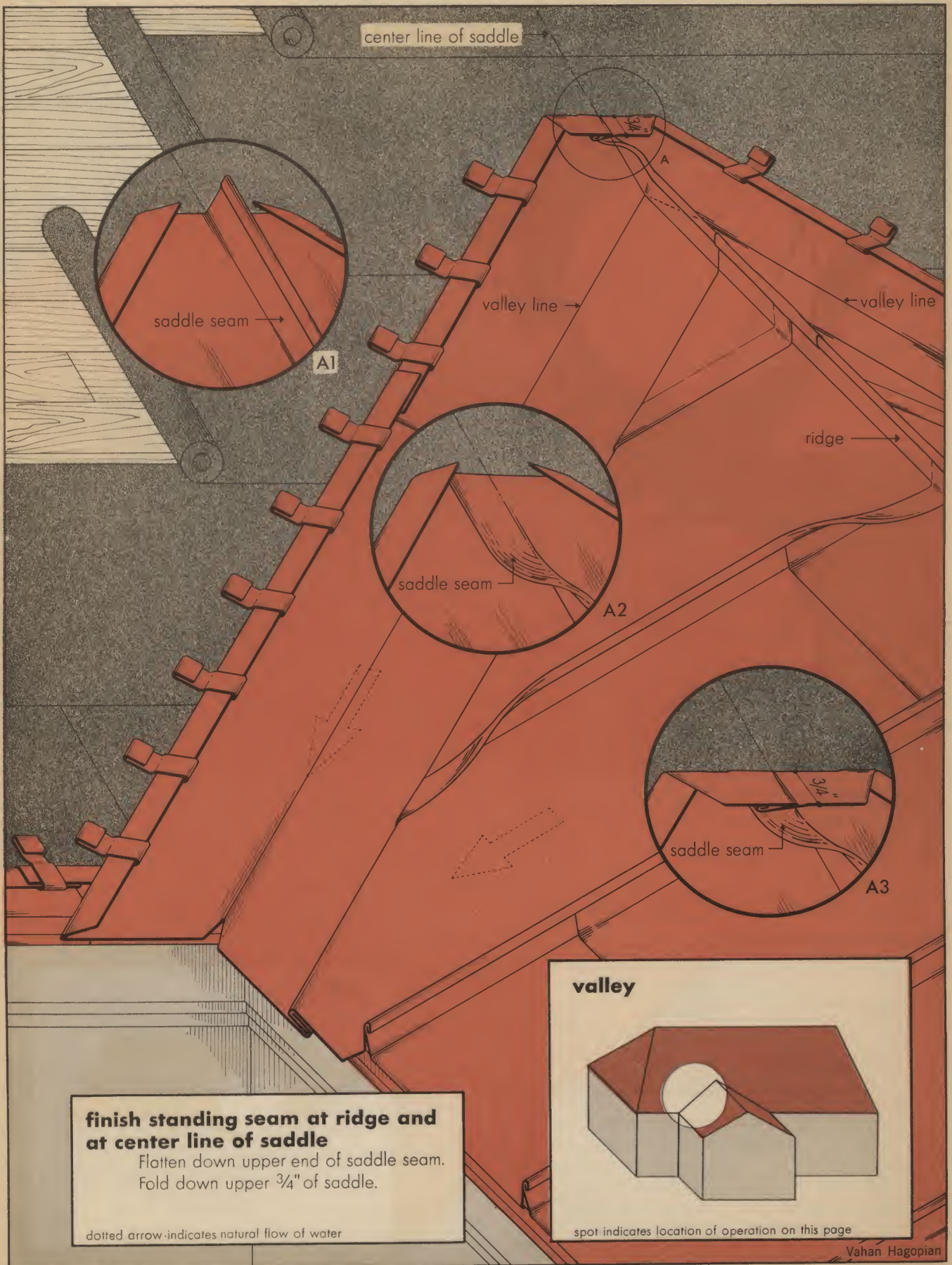


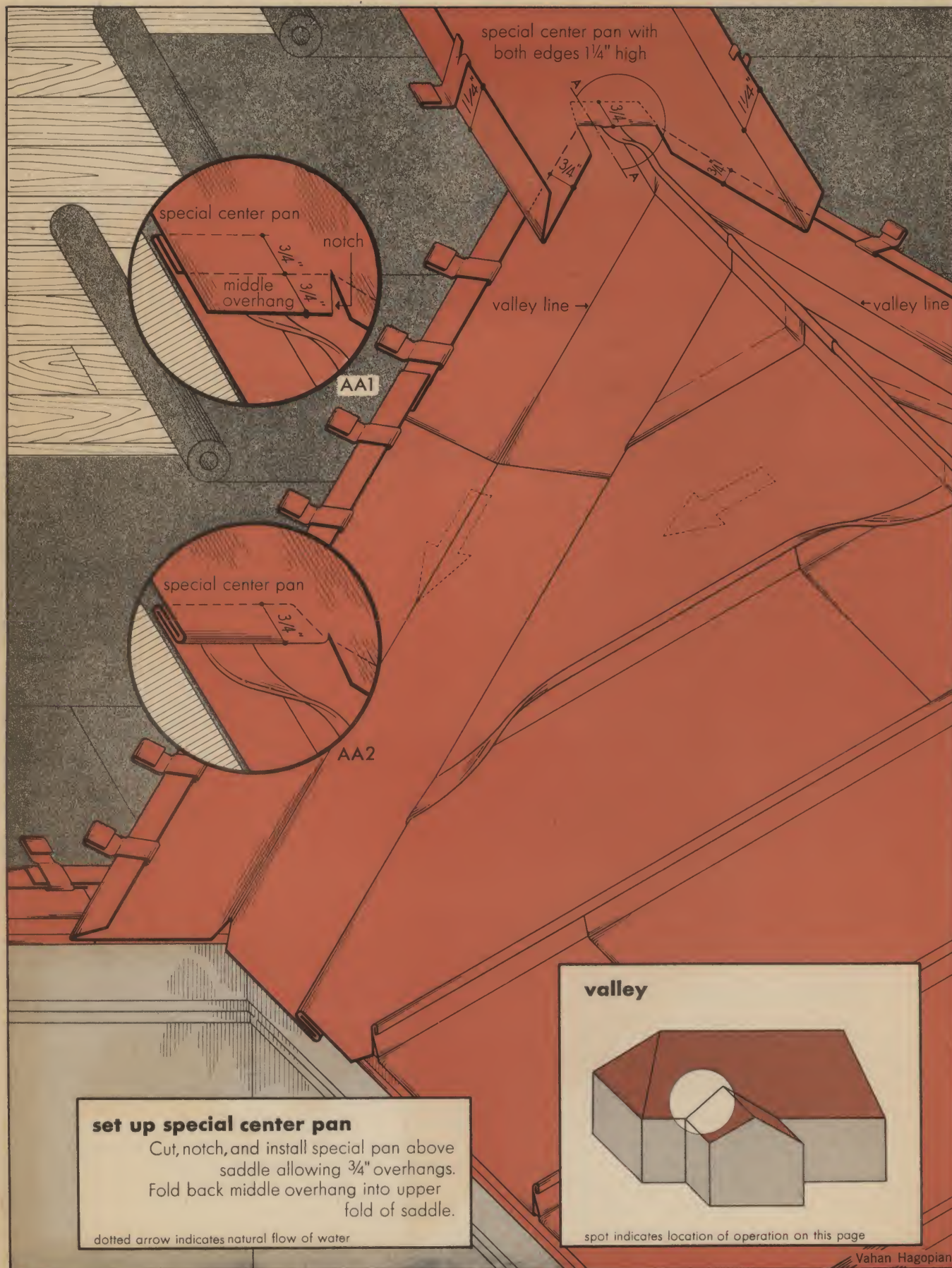


cover second valley and second roof slope

Allow overhang of $1\frac{1}{4}$ " beyond ridge and beyond center line.

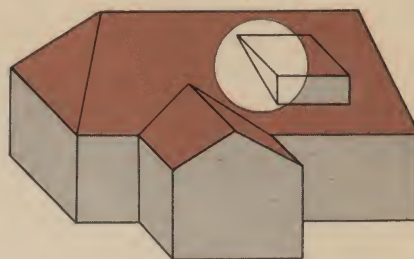
dotted arrow indicates natural flow of water







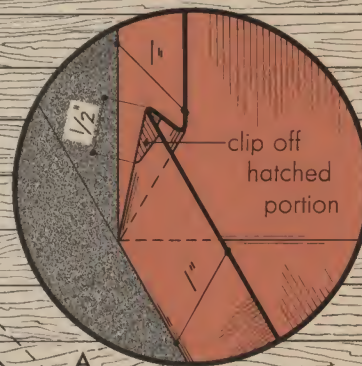
lean-to dormer



spot indicates location of operation on this page

to be left
unnailedwooden wedge
sawed to fit angle
between dormer
roof and main roof

flashing sections



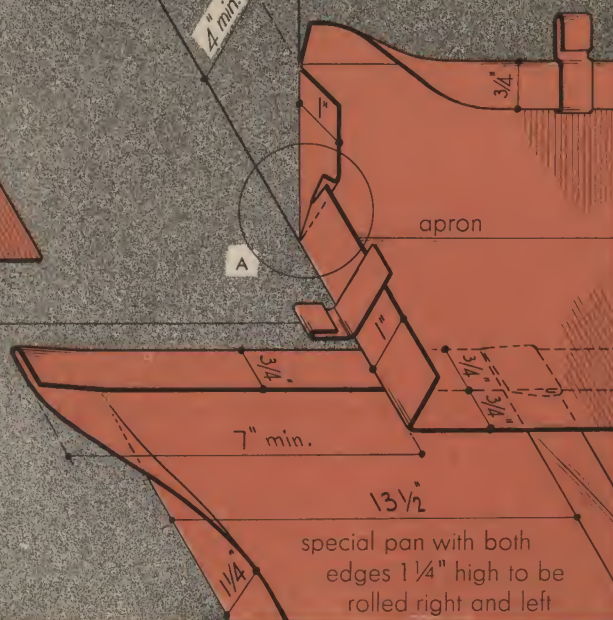
A

set up apron and prepare flashing

At meeting of roof and face of dormer set up apron allowing $\frac{3}{4}$ " overhang for cross lock to roofing below.

Assemble sections of flashing to be placed at meeting of roof and side of dormer.

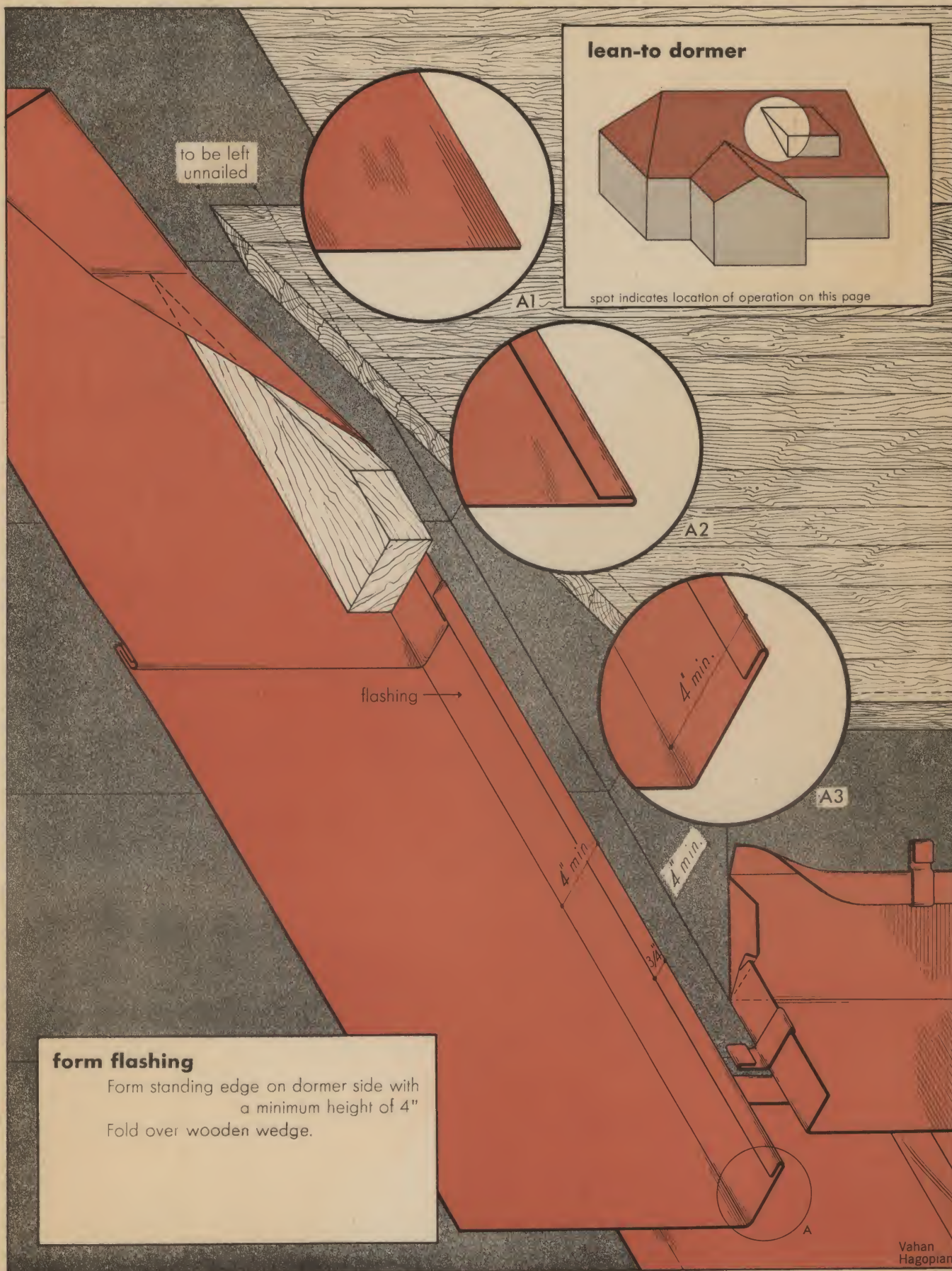
Cut wooden wedge.



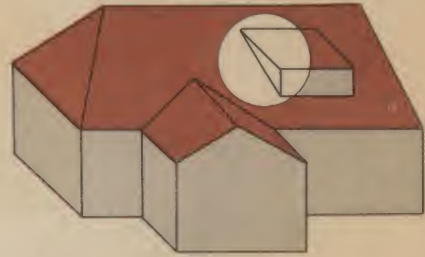
A

apron

special pan with both
edges $1\frac{1}{4}$ " high to be
rolled right and left



lean-to dormer



spot indicates location of operation on this page

seams at ends of
apron to be rolled
inwards toward center
of dormer.

AA

flashing

cut off hatched portion

fit flashing into place

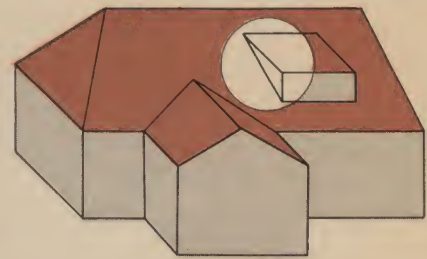
Use wedge for fitting to angle formed
by roof and dormer.
Cut off surplus metal.

dotted arrow indicates natural flow of water

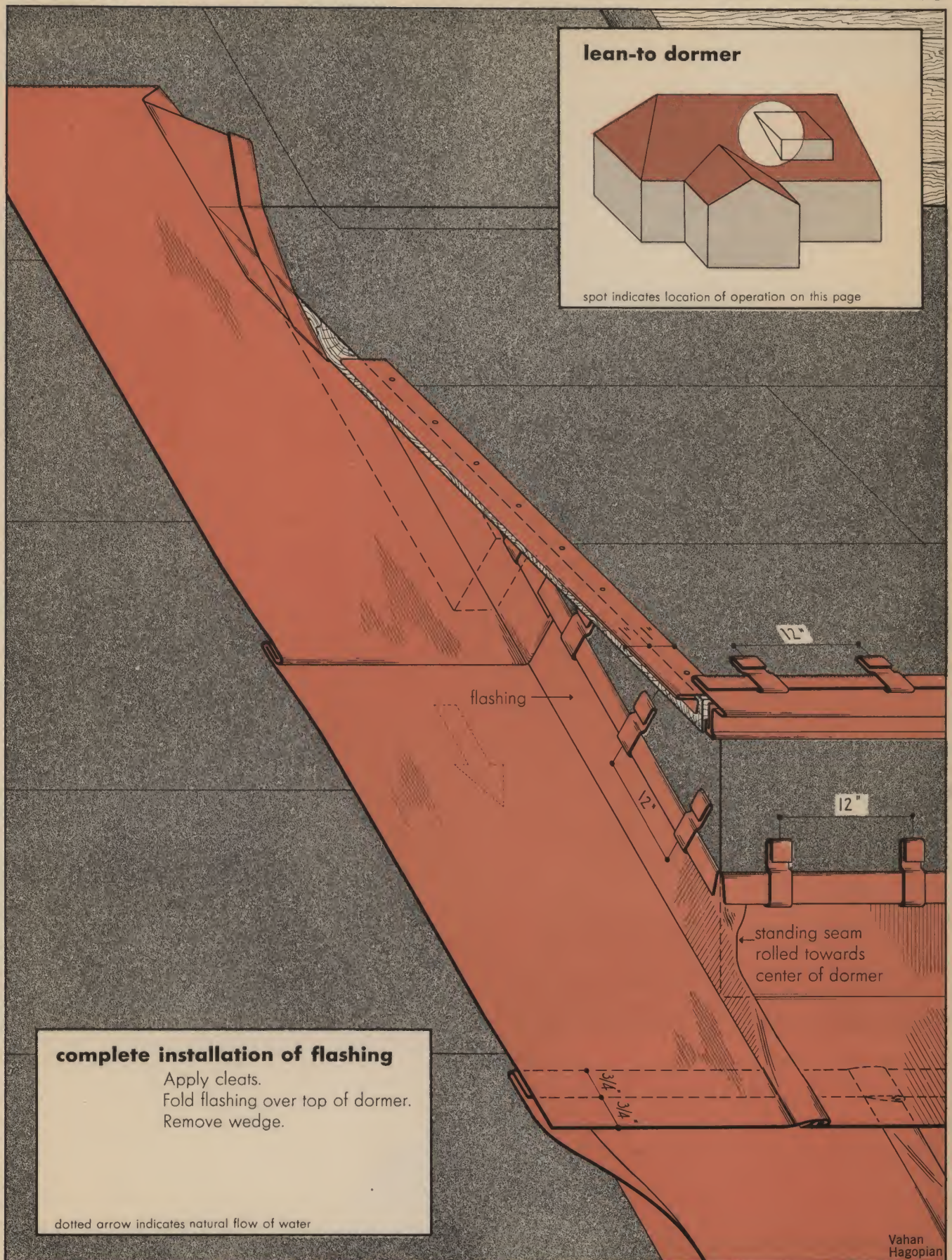
cut off
hatched portion
curve
apron

Vahan
Hagopian

lean-to dormer



spot indicates location of operation on this page

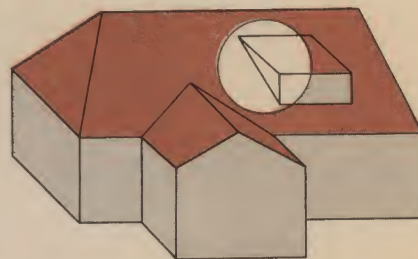


complete installation of flashing

Apply cleats.
Fold flashing over top of dormer.
Remove wedge.

dotted arrow indicates natural flow of water

Vahan
Hagopian

lean-to dormer

spot indicates location of operation on this page

apron as shown
in plate 63-E may
be used here

cut off
hatched
portion

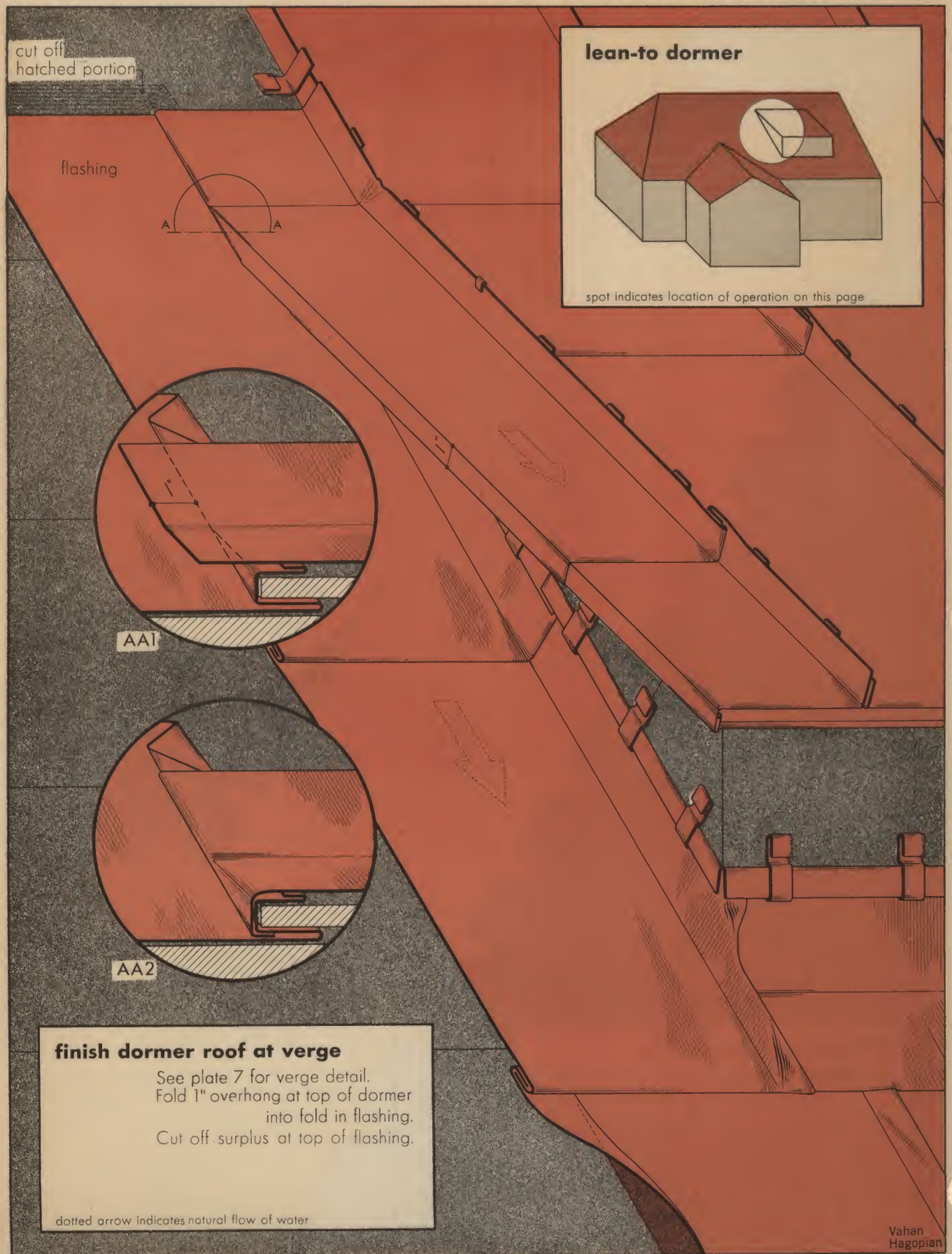
for dormer roof with
flat slope see alternate
method, plate 63-E

lay up dormer roof

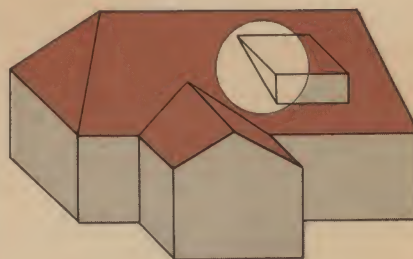
Install typical standing seam roof allowing
2" overhang at sides of dormer.
See plate 5 for eave detail.
Cut excess metal from upper part of 2"
overhang.

dotted arrow indicates natural flow of water

Vahan
Hagopian



lean-to dormer



spot indicates location of operation on this page

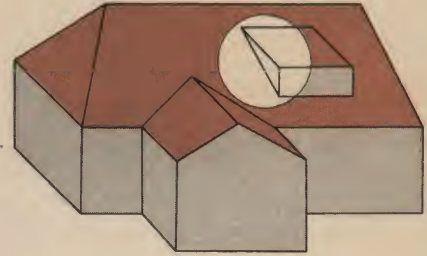
**prepare for assemblage
to adjacent pans**

Fold back $\frac{3}{4}$ " for cross seam at top.
Form typical $\frac{1}{4}$ " standing edge.
Apply cleats.

dotted arrow indicates natural flow of water

Vahan
Hagopian

lean-to dormer



spot indicates location of operation on this page

wood crown
moulding

seam rolled
away from dormer

edge of copper
flashing

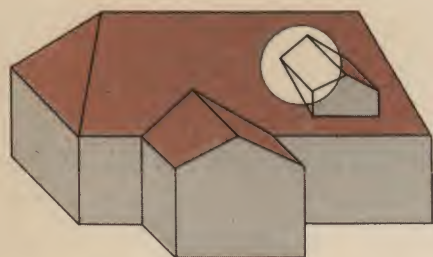
siding

lay up adjacent roofing

Dormer now ready for siding over flashing
and for crown moulding.

dotted arrow indicates natural flow of water

gable dormer



spot indicates location of operation on this page

9"

wooden wedge sawed
to fit angle between
dormer eave and main
roof.

fit flashing into place

Use wedge for fitting to angle formed
by roof and dormer.

See Plate 25.

flashing

7" min.

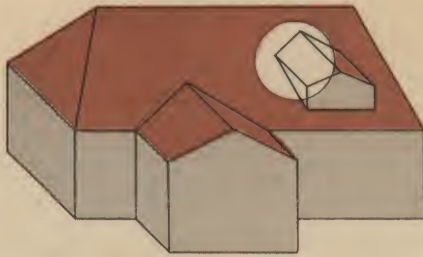
4" min.

3/4"

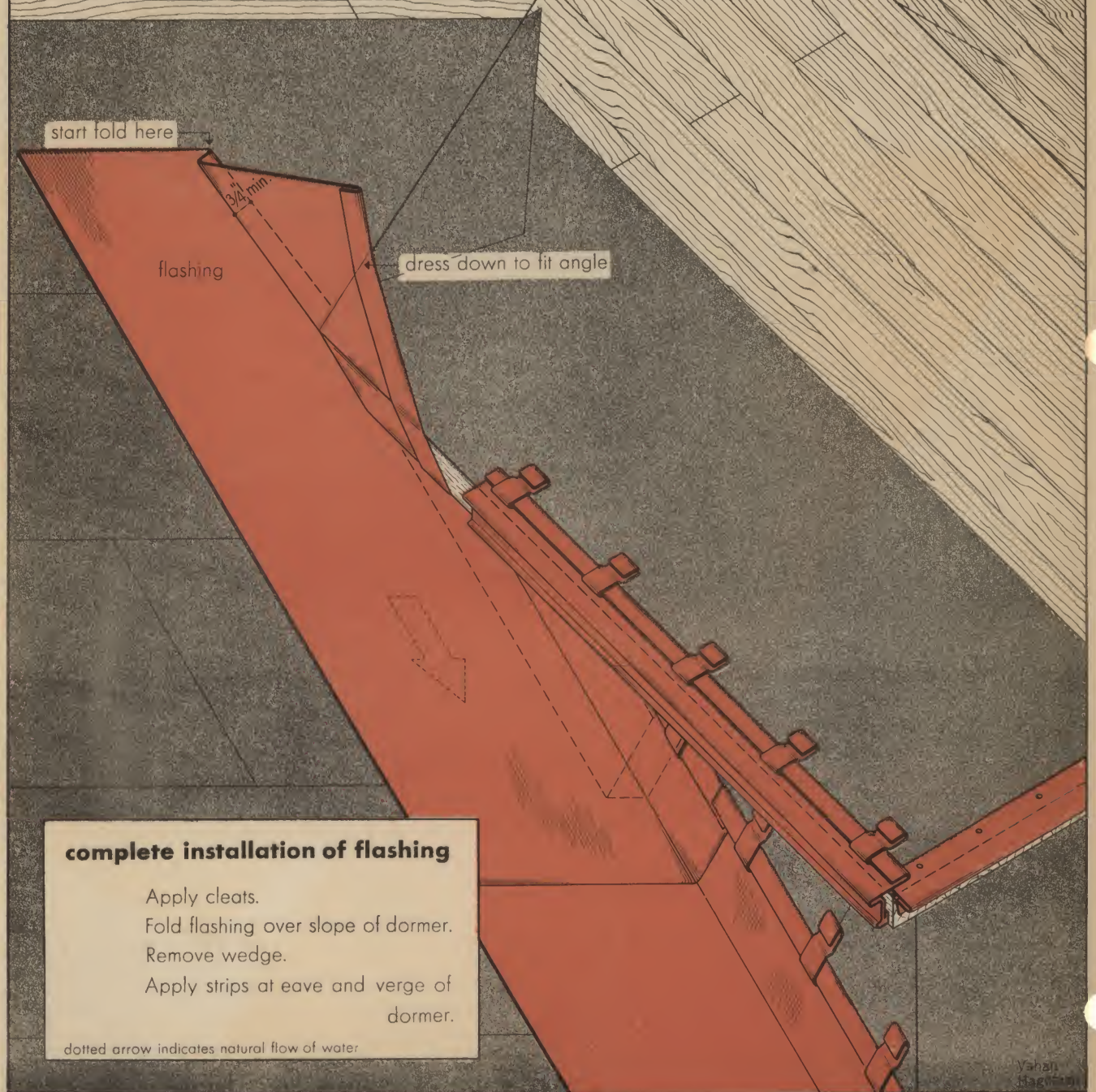
dotted arrow indicates natural flow of water

Vahan
Hagopian

gable dormer



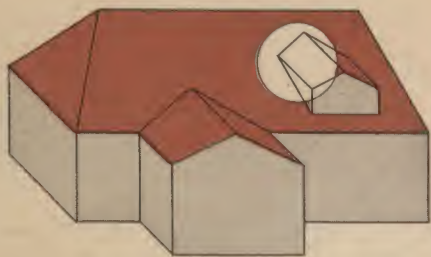
spot indicates location of operation on this page



complete installation of flashing

- Apply cleats.
- Fold flashing over slope of dormer.
- Remove wedge.
- Apply strips at eave and verge of dormer.

dotted arrow indicates natural flow of water

gable dormer

spot indicates location of operation on this page

See Plate 16

fold of flashing

valley line

cut off
hatched portion

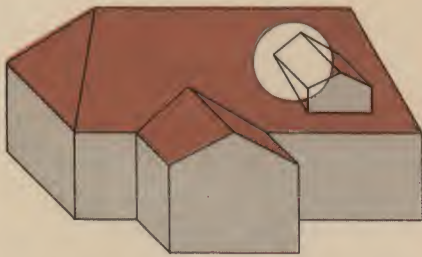
set up valley

Form valley section into place.
Install dormer pans.
Lock dormer pans to valley.
Cut off surplus copper at bottom
of valley allowing $\frac{3}{4}$ "
overhang beyond fold
of flashing.

dotted arrow indicates natural flow of water

Vahan
Hagopian

gable dormer



spot indicates location of operation on this page

cut off
hatched portion

valley line

flashing

A A

valley line

$\frac{3}{4}$ "

AA1

valley line

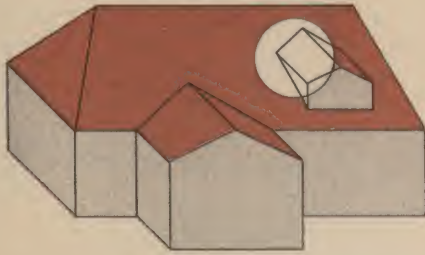
AA2

lock valley section to flashing

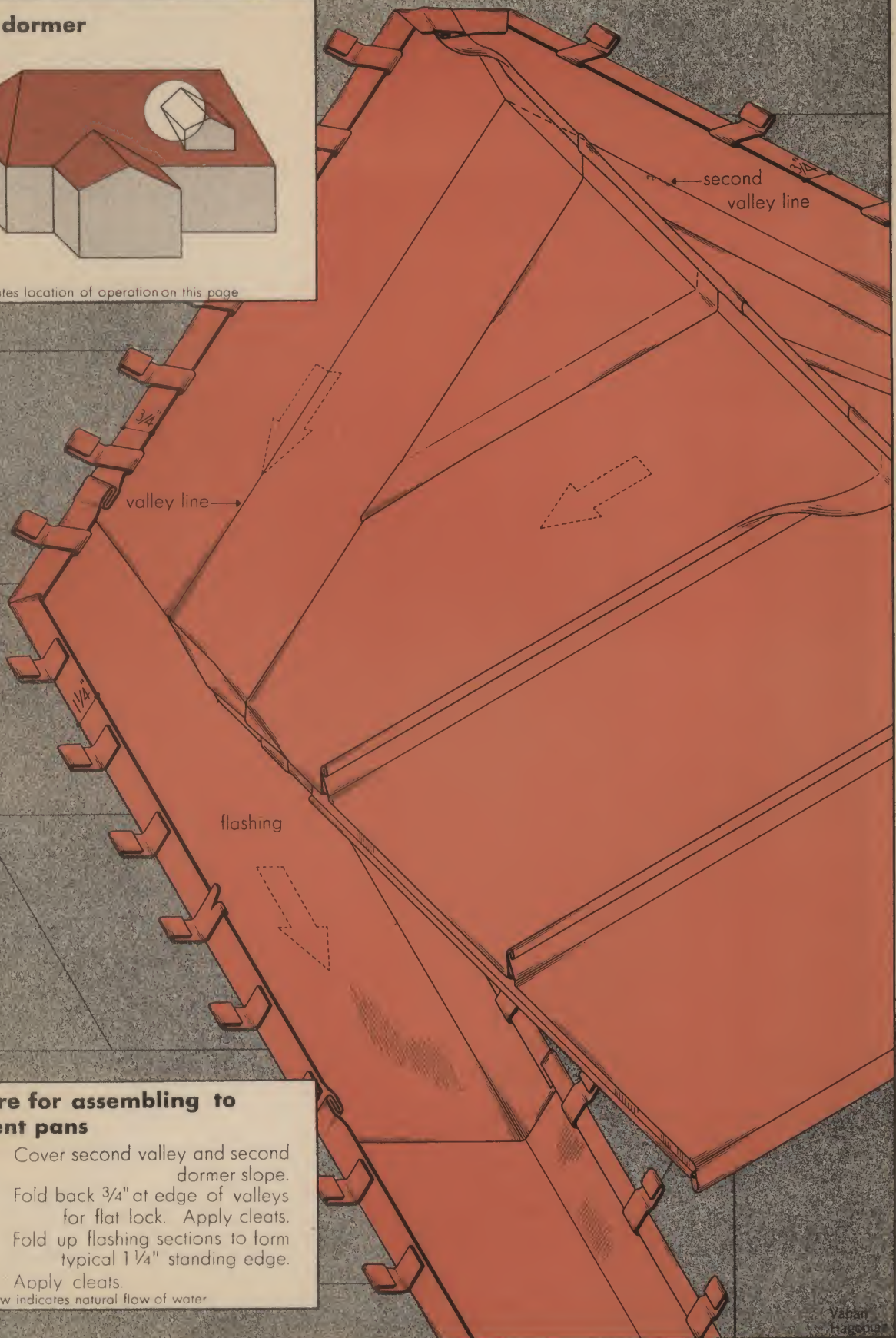
Fold $\frac{3}{4}$ " overhang of valley section
into fold of flashing.
Cut off surplus copper at upper part
of flashing.

dotted arrow indicates natural flow of water

Vahan
Hagopian

gable dormer

spot indicates location of operation on this page

**prepare for assembling to adjacent pans**

Cover second valley and second dormer slope.
Fold back $\frac{3}{4}$ " at edge of valleys for flat lock. Apply cleats.
Fold up flashing sections to form typical $1\frac{1}{4}$ " standing edge.
Apply cleats.

dotted arrow indicates natural flow of water

Vehari
Hagopian

gable dormer



spot indicates location of operation on this page

seam rolled away from
dormer and valley flow →

lay up adjacent roofing

Dormer now ready for siding over
flashing and for crown moulding.

dotted arrow indicates natural flow of water

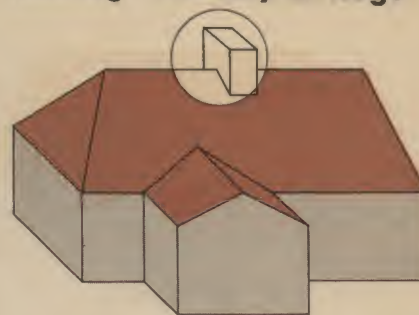
edge of copper
flashing →

↑ wood
crown moulding

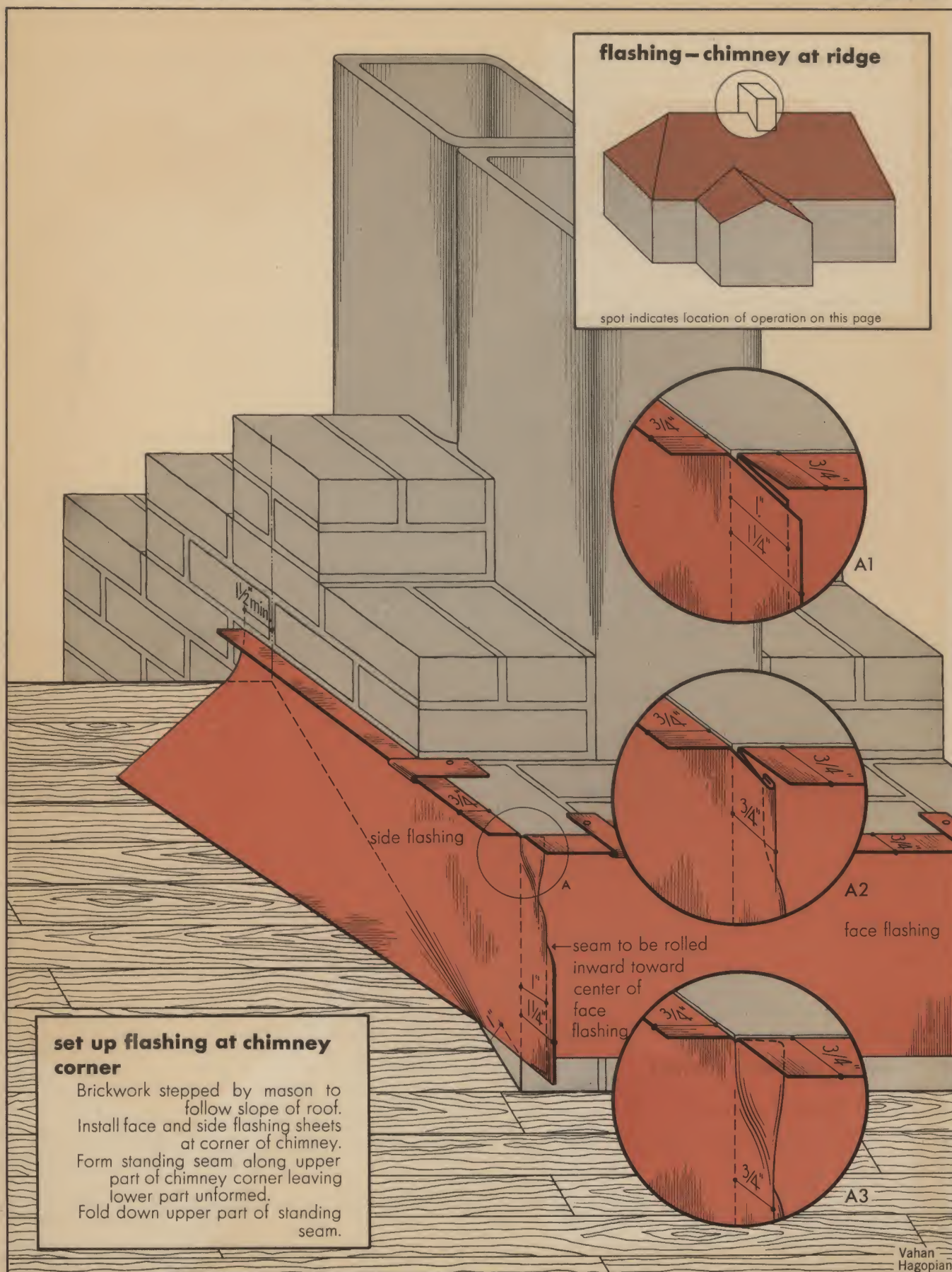
siding

Vahan
Hagopian

flashing – chimney at ridge

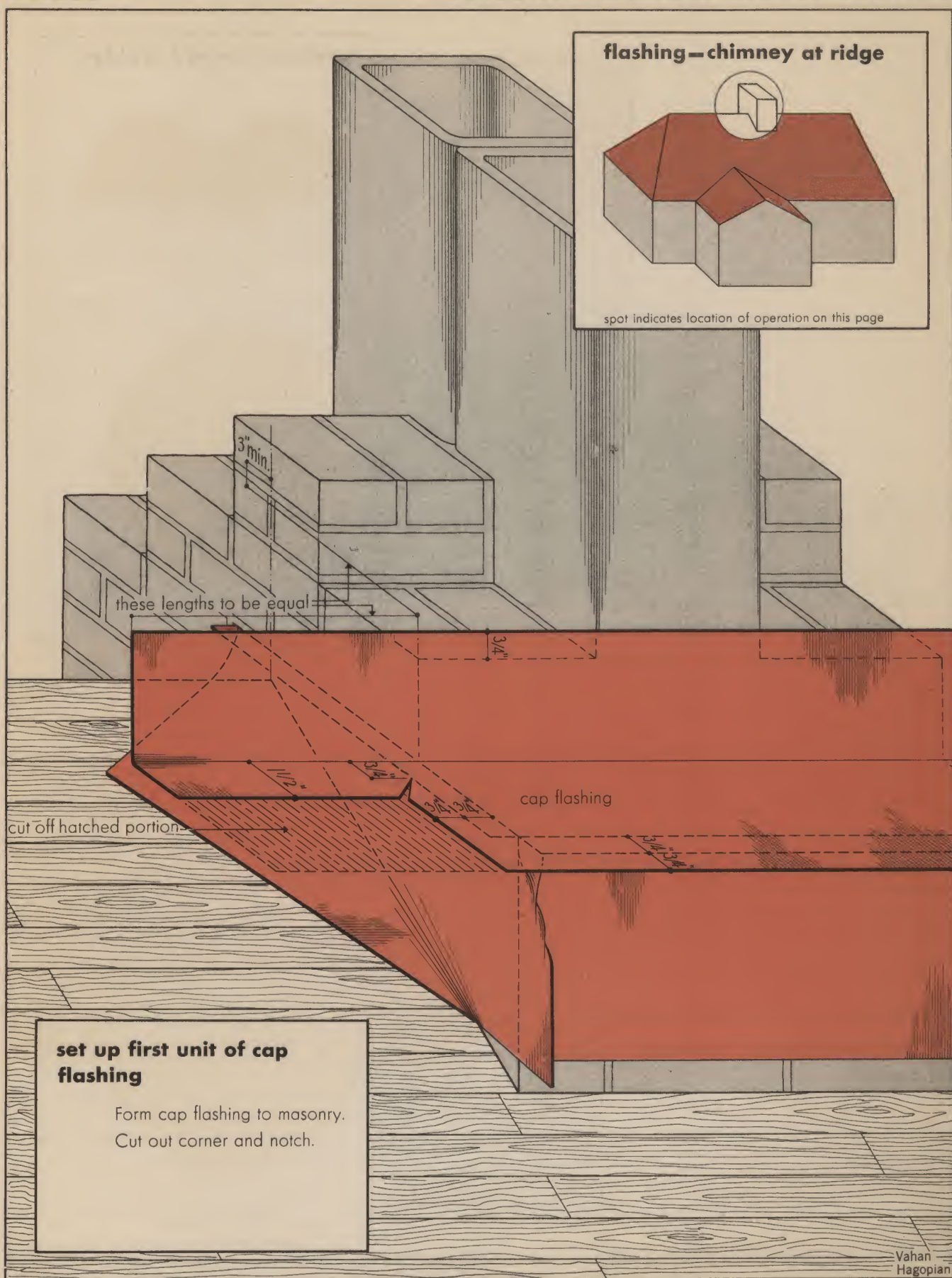


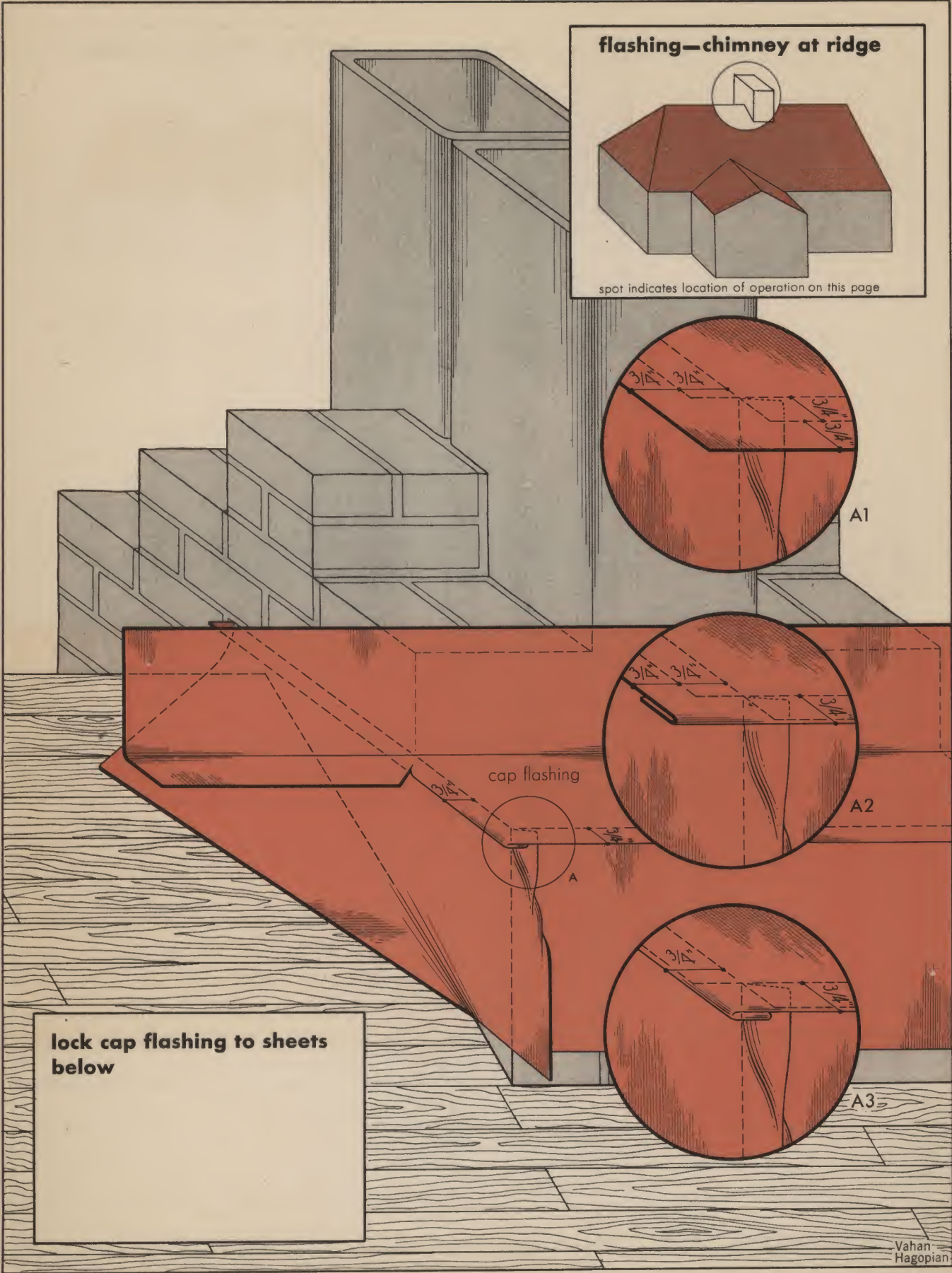
spot indicates location of operation on this page



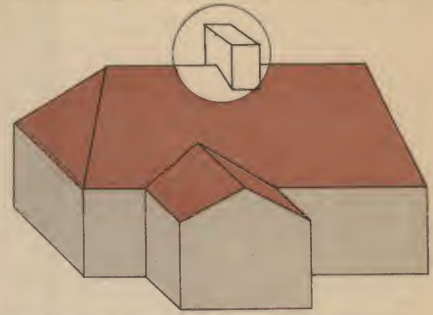
set up flashing at chimney corner

Brickwork stepped by mason to follow slope of roof.
 Install face and side flashing sheets at corner of chimney.
 Form standing seam along upper part of chimney corner leaving lower part unformed.
 Fold down upper part of standing seam.

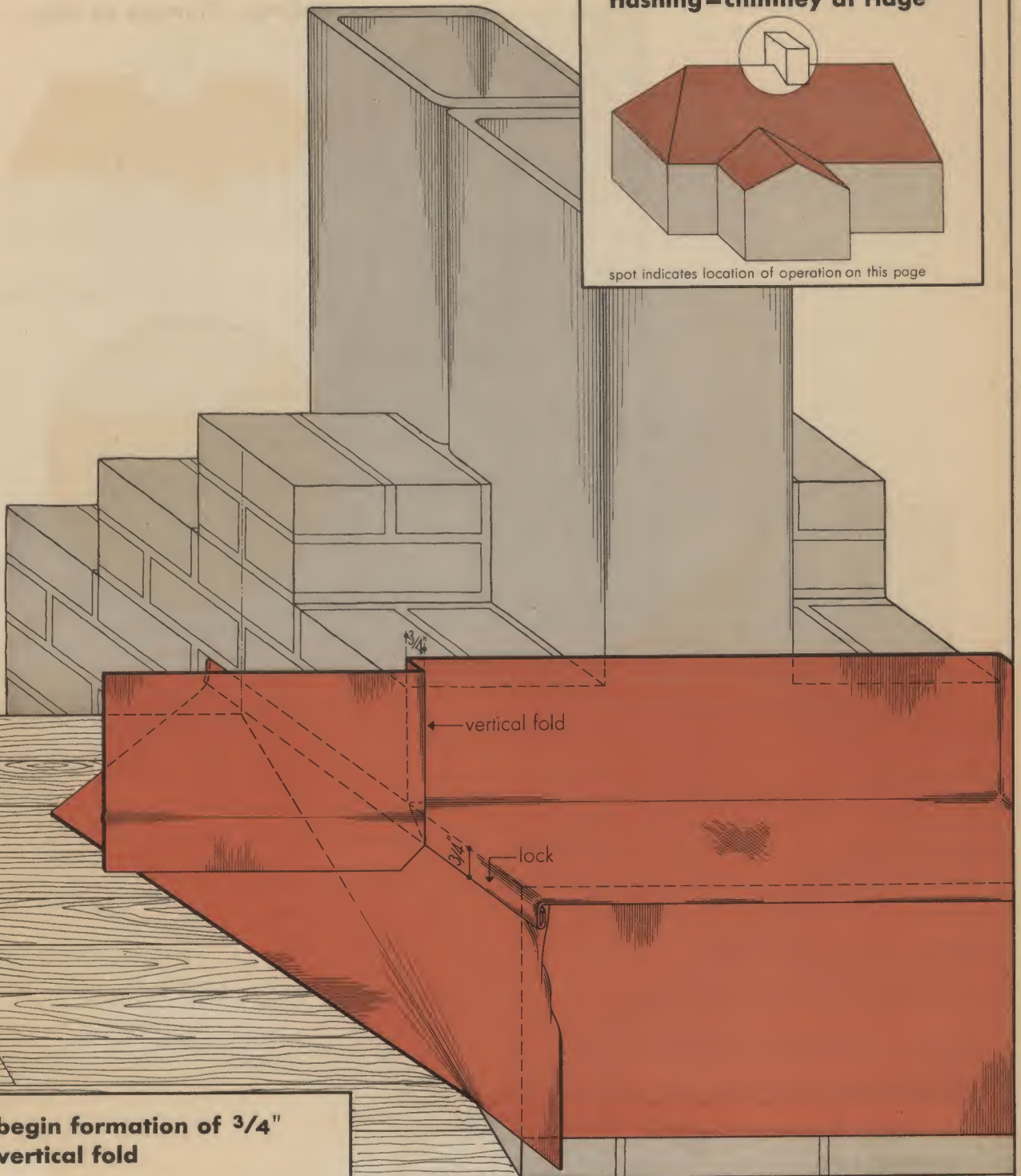




flashing – chimney at ridge



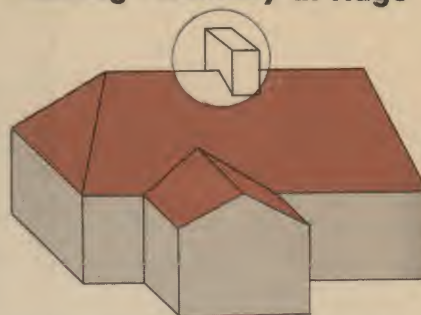
spot indicates location of operation on this page



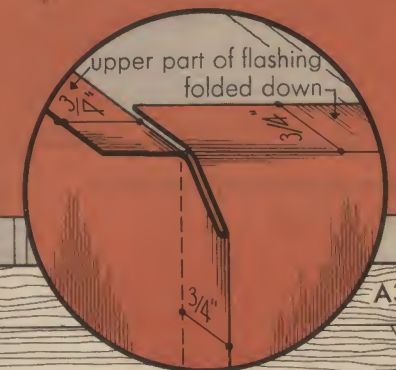
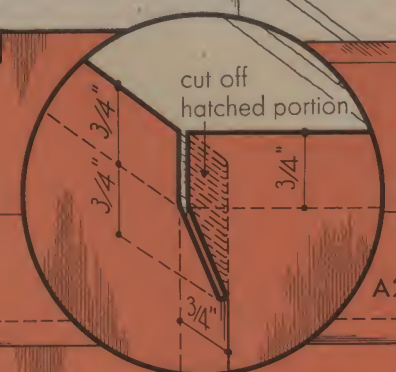
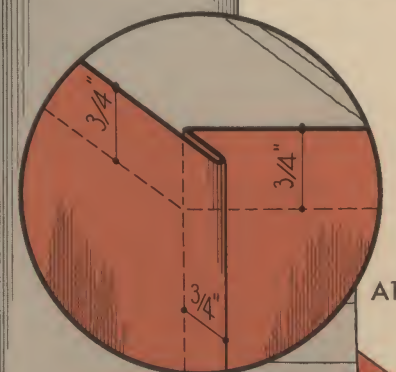
begin formation of $\frac{3}{4}"$ vertical fold

Dress down $\frac{3}{4}"$ lock on side of chimney beginning vertical fold at the same time.

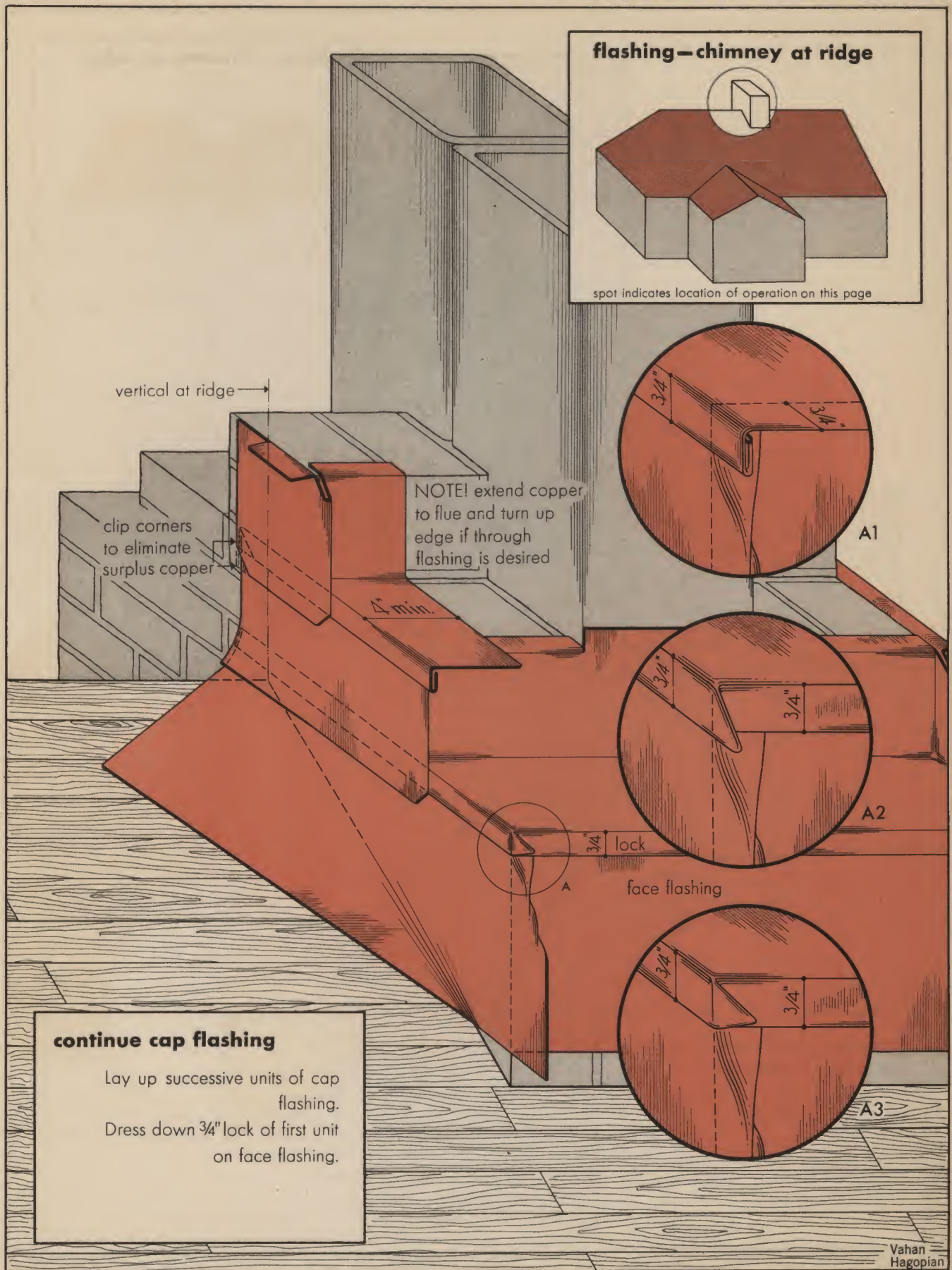
flashing—chimney at ridge

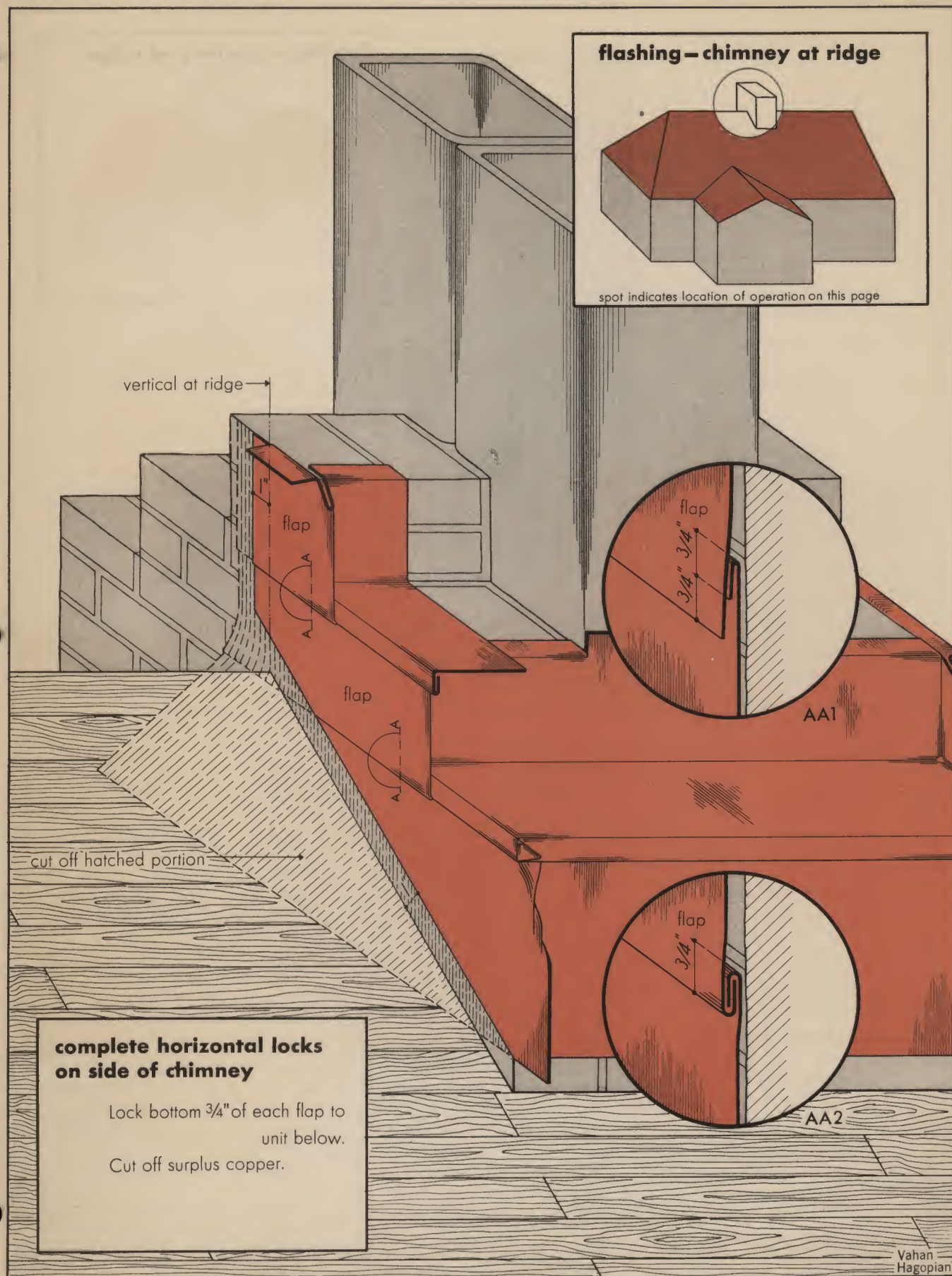


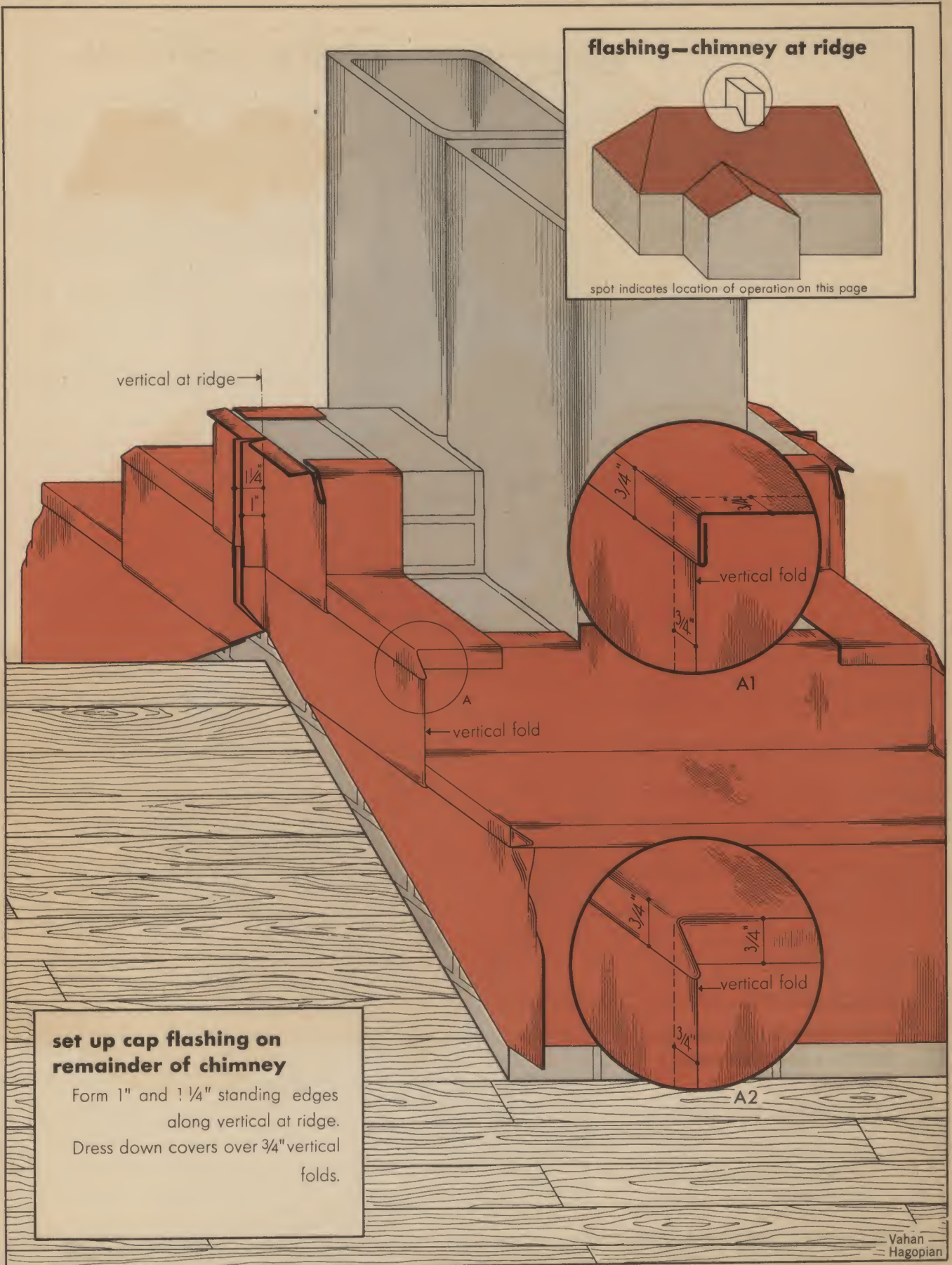
spot indicates location of operation on this page

**complete formation of 3/4" vertical fold**

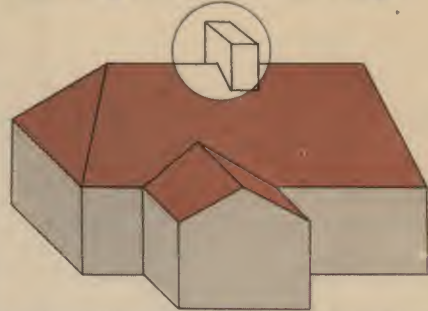
Bring flap against side of chimney.
 Clip off upper portion of vertical fold.
 Fold down upper 3/4" of flashing to horizontal position.



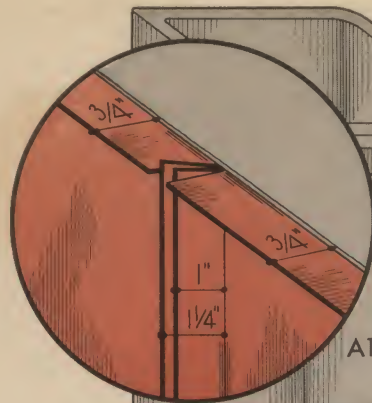




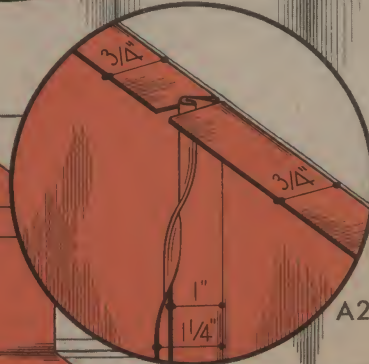
flashing – chimney at ridge



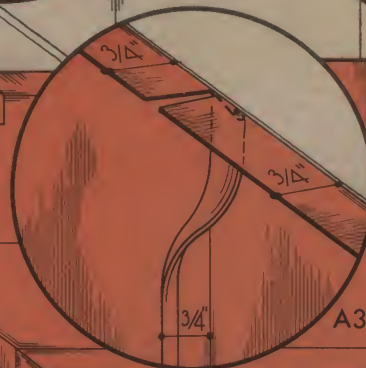
spot indicates location of operation on this page



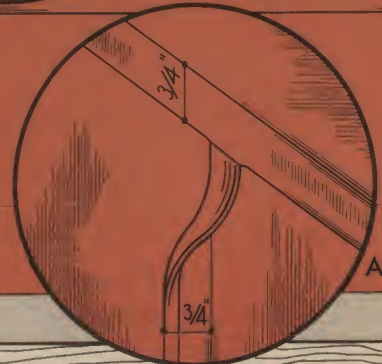
A1



A2



A3

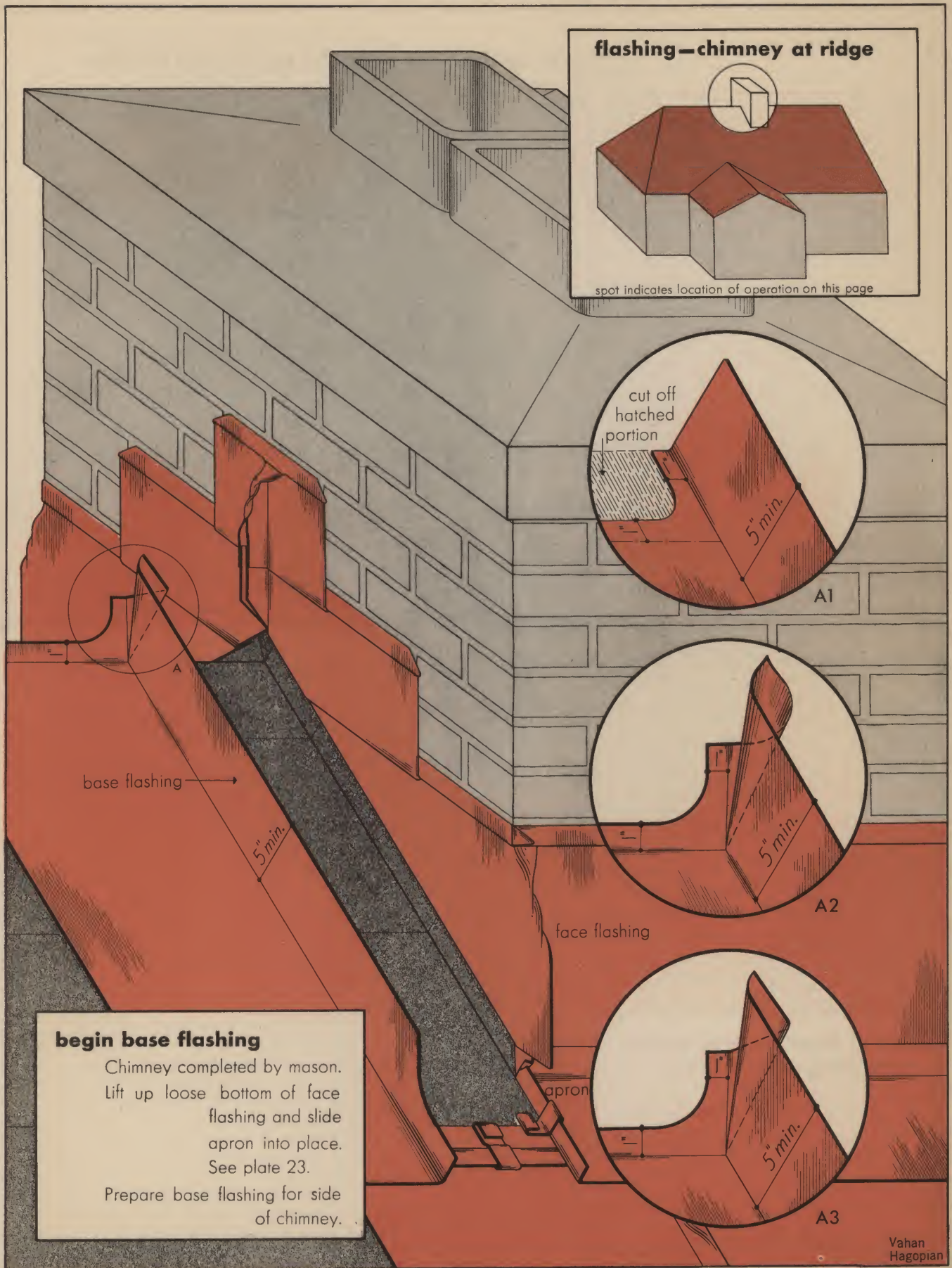


A4

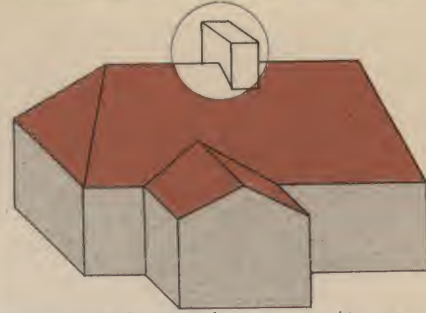
**form standing seam and
install uppermost cap
flashing**

Form standing seam along vertical
at ridge leaving lower part
unformed.

Fold down upper part of seam and
set up uppermost section of
cap flashing.



flashing—chimney at ridge



spot indicates location of operation on this page

base flashing →

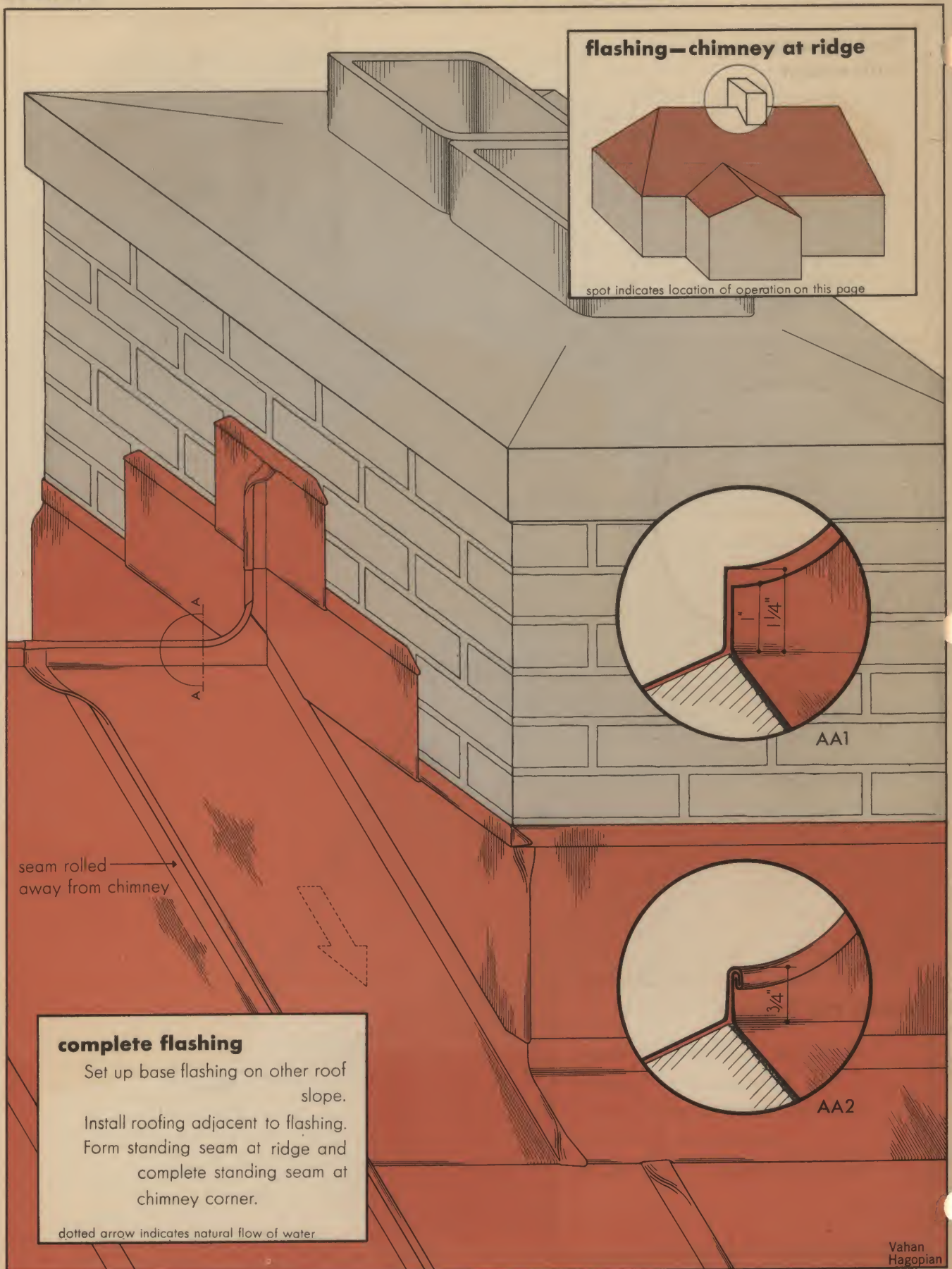
side
flashing

**install base flashing at side
of chimney**

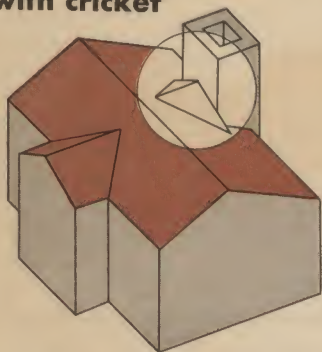
Lift up loose bottom of side
flashing and slide base
flashing into place.

dotted arrow indicates natural flow of water

Vahan
Hagopian



**flashing—chimney
with cricket**



spot indicates location of operation on this page

seams to be
rolled in direction of
slope of roof

AA

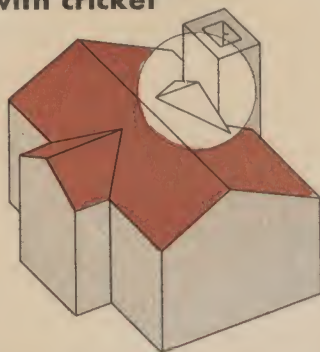
install cap flashing

Cricket built by carpenter to project
4" beyond sides of chimney.
Brickwork stepped by mason to follow
slope of roof and cricket.
Set up cap flashing. See Plate 45.

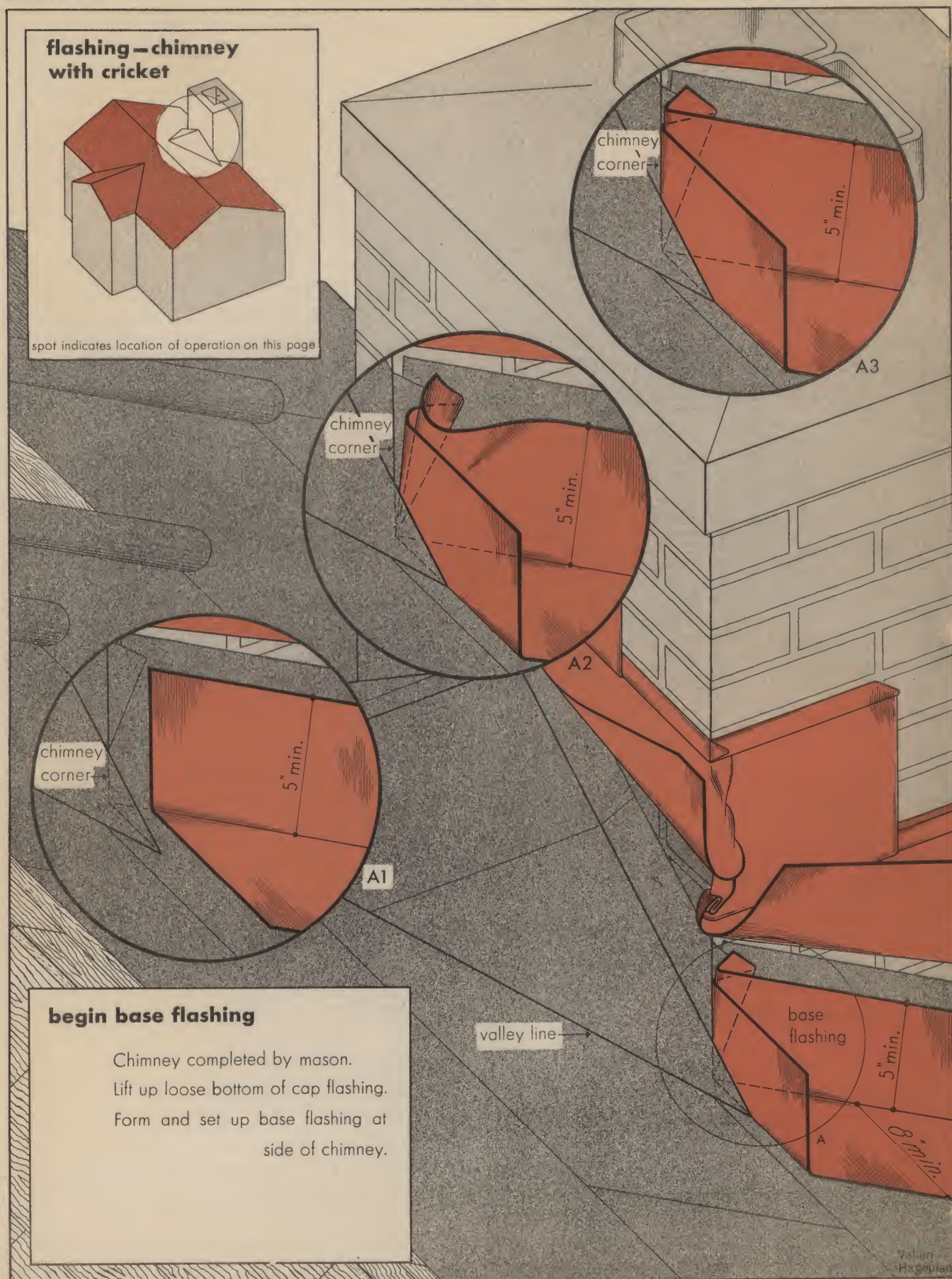
dotted arrow indicates natural flow of water

Vahan
Hagopian

**flashing — chimney
with cricket**



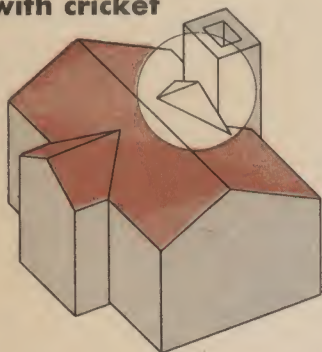
spot indicates location of operation on this page



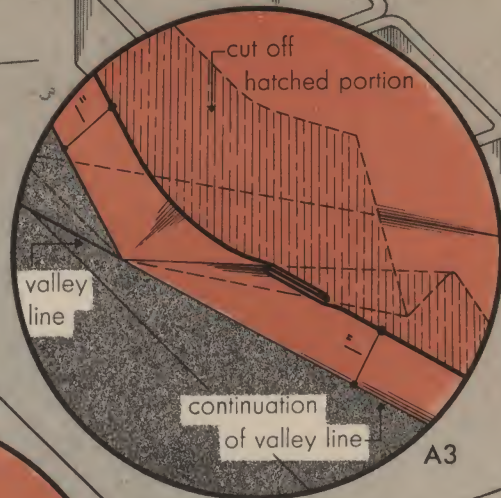
begin base flashing

Chimney completed by mason.
Lift up loose bottom of cap flashing.
Form and set up base flashing at
side of chimney.

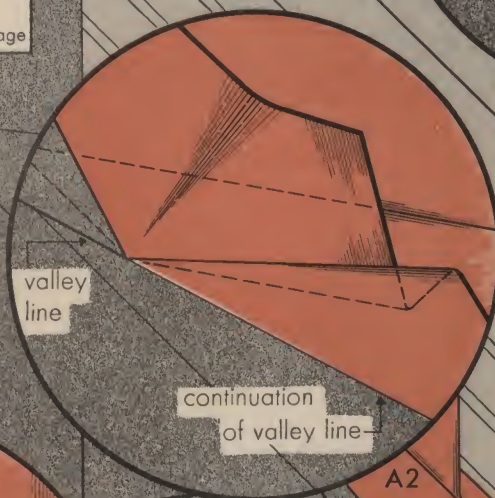
flashing—chimney with cricket



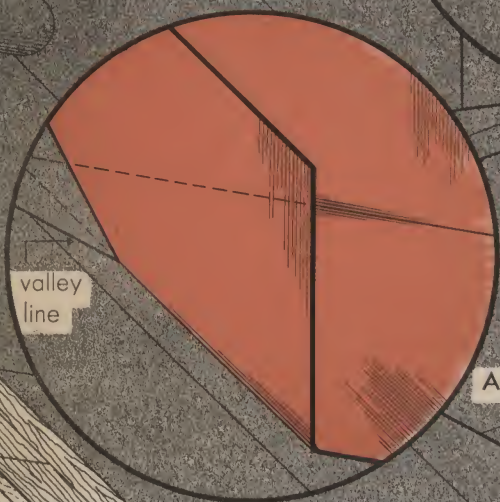
spot indicates location of operation on this page



A3



A2



A1

complete base flashing

Fold base flashing to continue valley line.
Cut off surplus metal.

valley line

continuation of valley line

base flashing

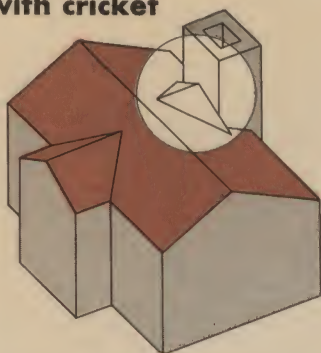
5" min.

8" min.

A

Vahen Hagopian

flashing—chimney with cricket



spot indicates location of operation on this page

cut off
hatched portion

cricket
ridge

valley
line

install valley section

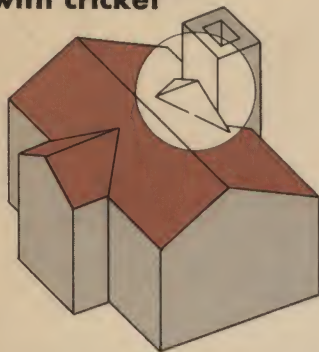
Shape valley section into place.
Cut off surplus copper.

cut off hatched
portion 5" min.

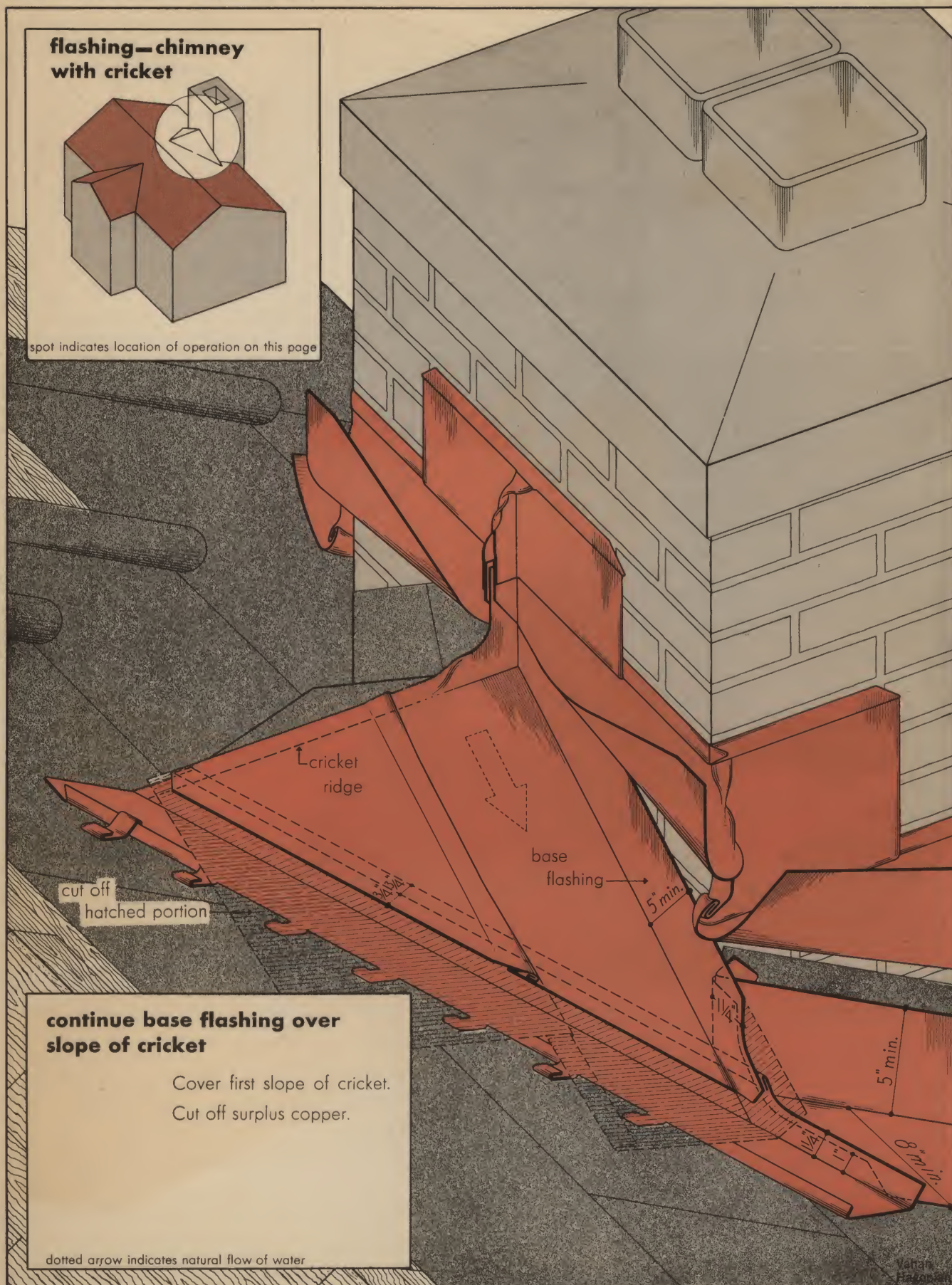
dotted arrow indicates natural flow of water

Vahon
Hagopian

**flashing—chimney
with cricket**



spot indicates location of operation on this page



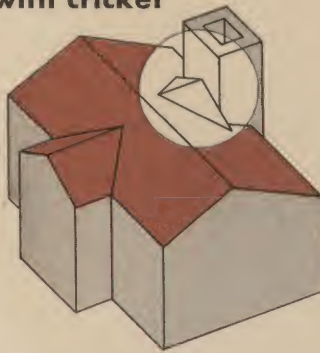
**continue base flashing over
slope of cricket**

Cover first slope of cricket.
Cut off surplus copper.

dotted arrow indicates natural flow of water

Vahan
Hagopian

flashing—chimney with cricket



spot indicates location of operation on this page

cut off
hatched portion

valley line

cricket
ridge

valley
line

complete cricket

Install second valley and second cricket slope. Assemble adjacent pans to valleys. See Plate 22.

Complete seams above ridge and at lower corners of chimney. See Plate 48.

dotted arrow indicates natural flow of water

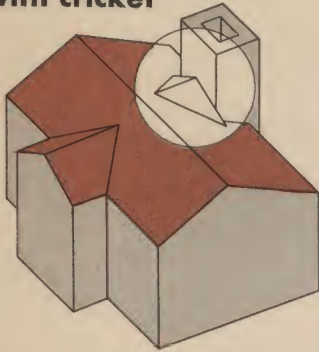
base
flashing

roll and flatten
standing seam away
from flow of water

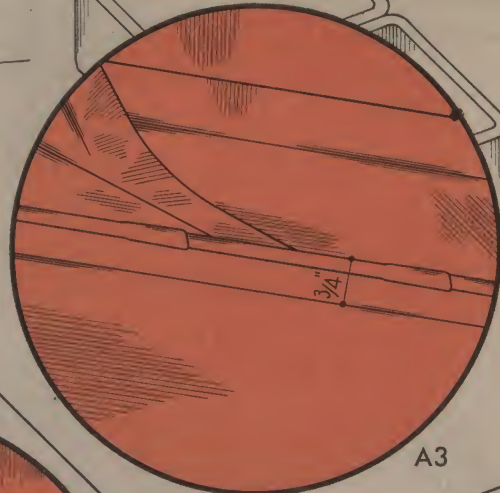
cut off hatched portion

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Hagopian

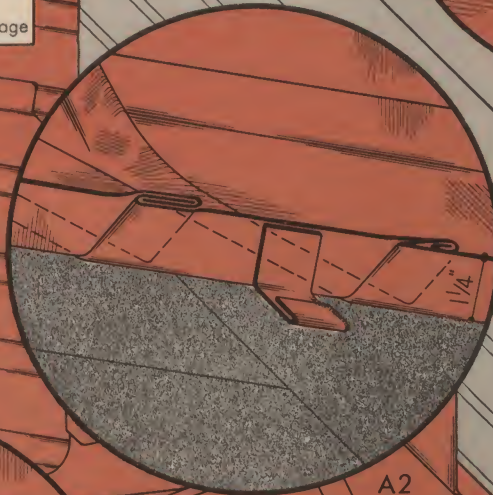
**flashing—chimney
with cricket**



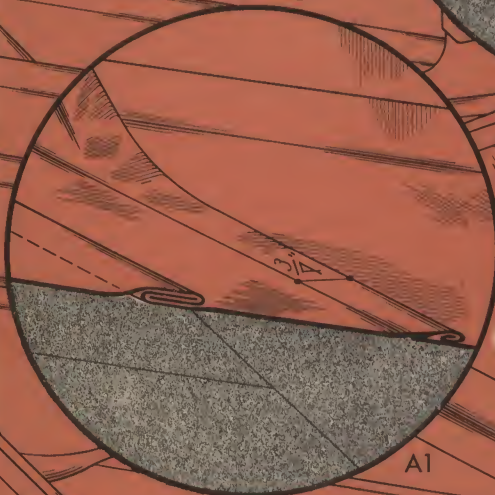
spot indicates location of operation on this page



A3



A2



A1

lay up adjacent roofing

Join adjacent roofing to valley and flashing by typical standing seam rolled away from chimney and valley flow.

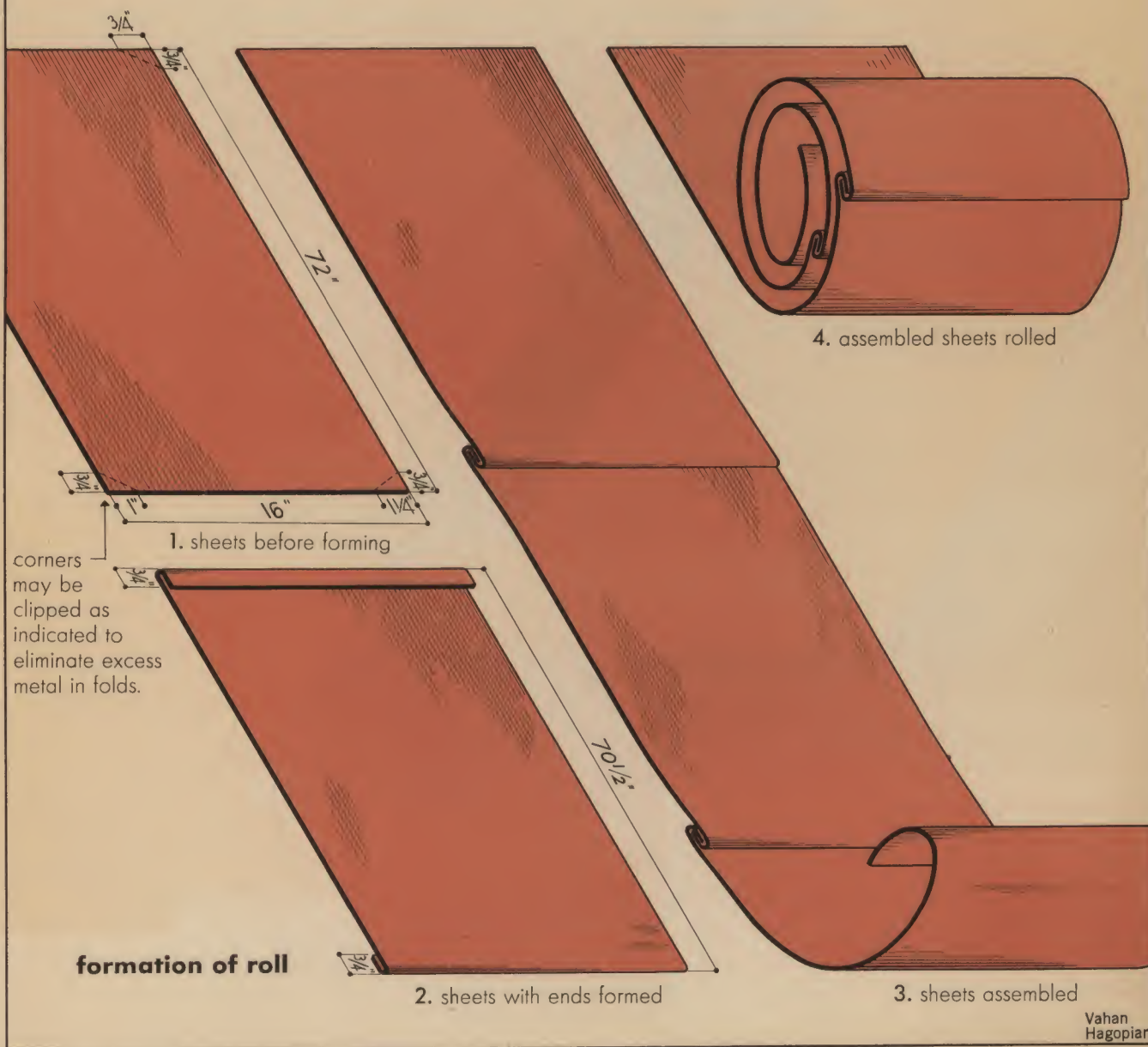
dotted arrow indicates natural flow of water

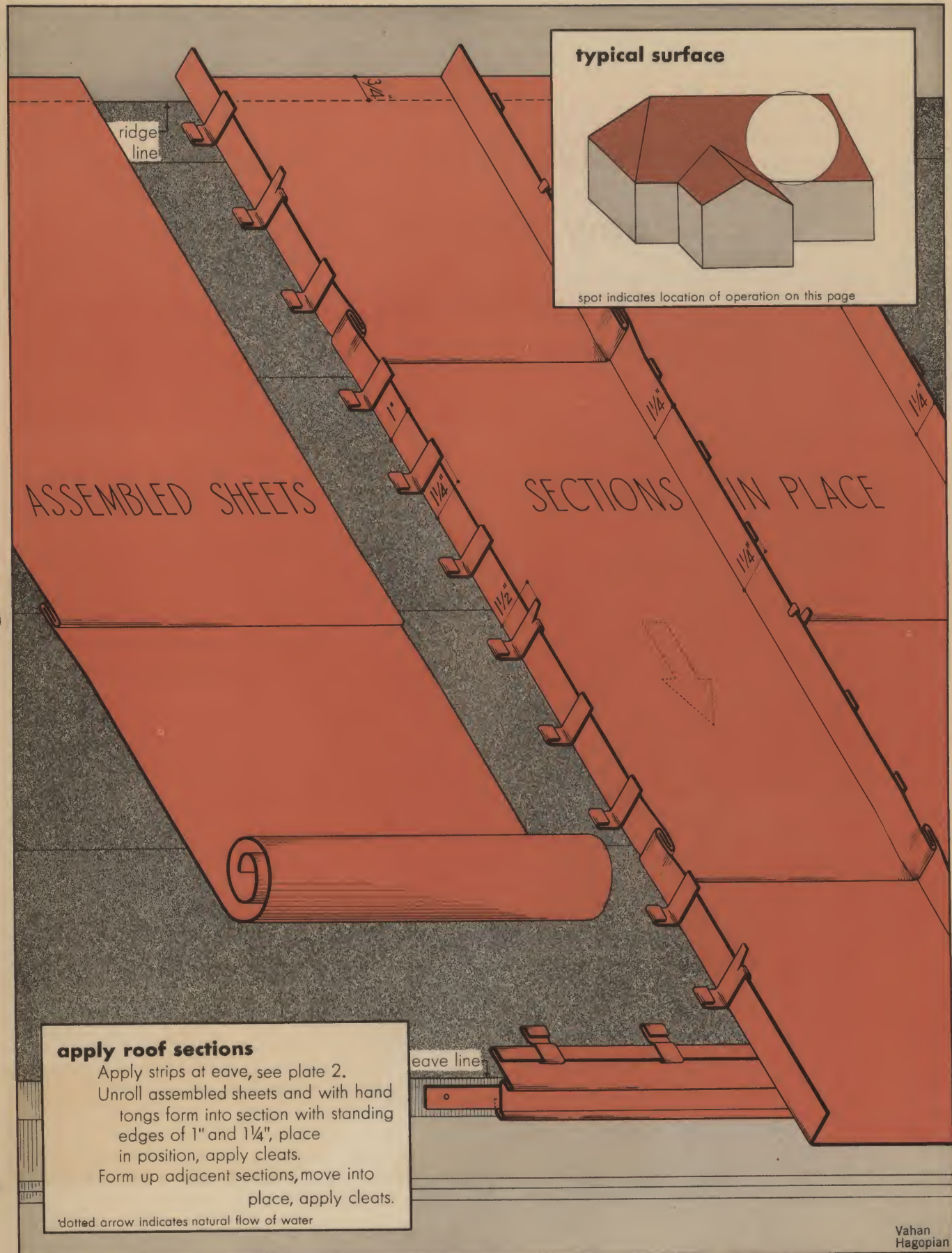
seam rolled away from chimney and valley flow

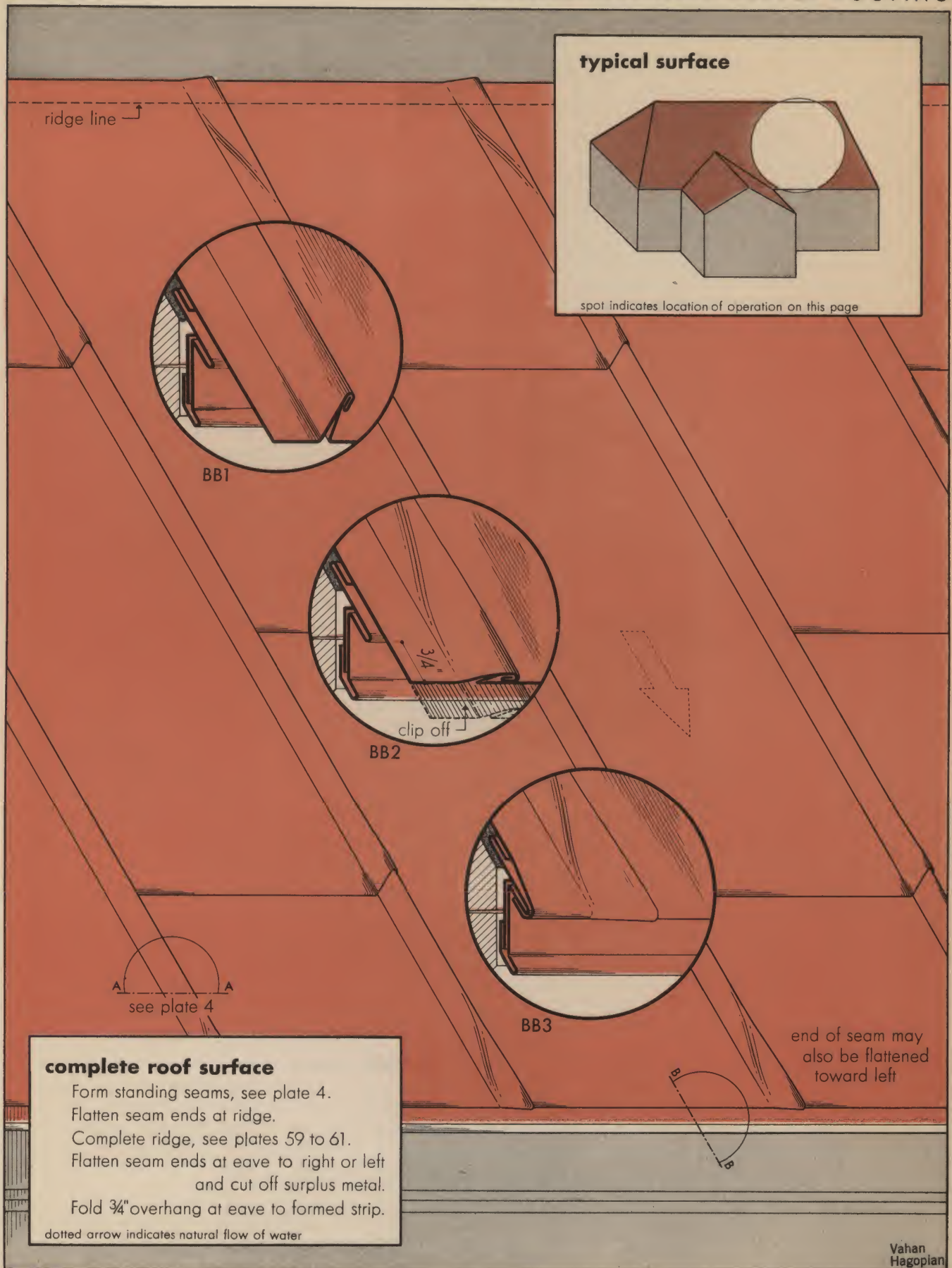
A

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Successive Steps in Laying Economy Copper Roofing *by the Roll Method*







typical surface

spot indicates location of operation on this page

BB1

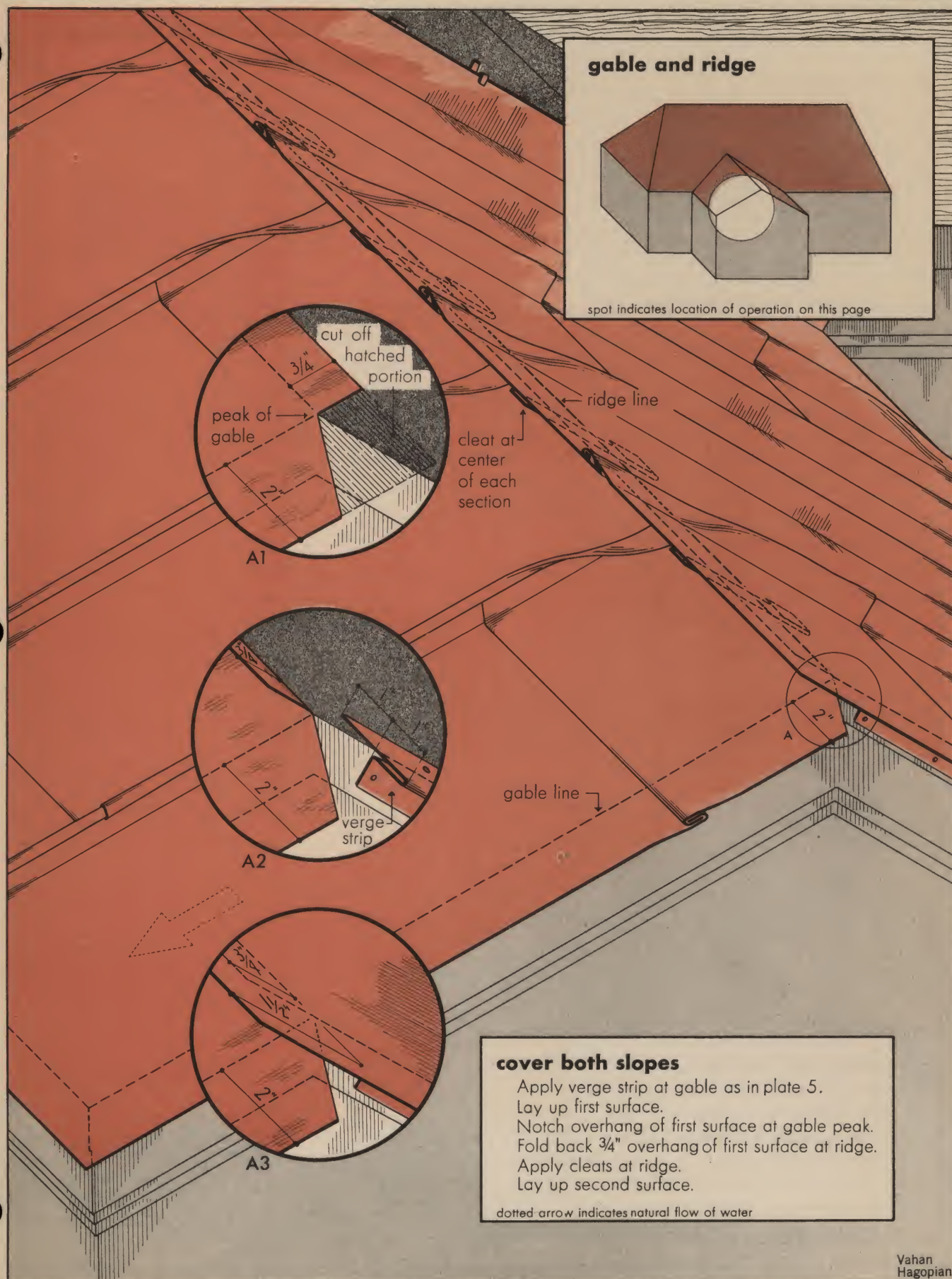
BB2

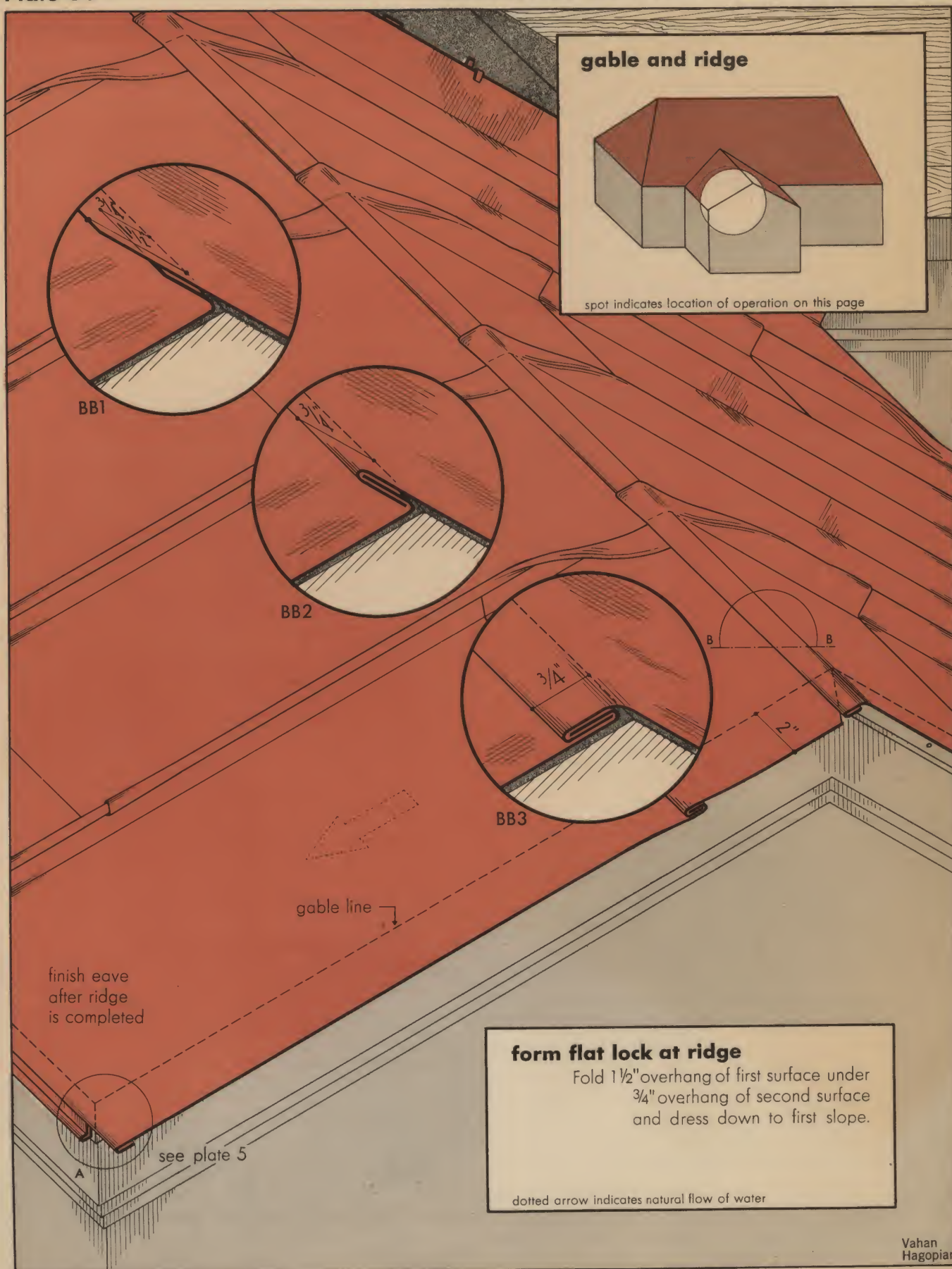
BB3

complete roof surface

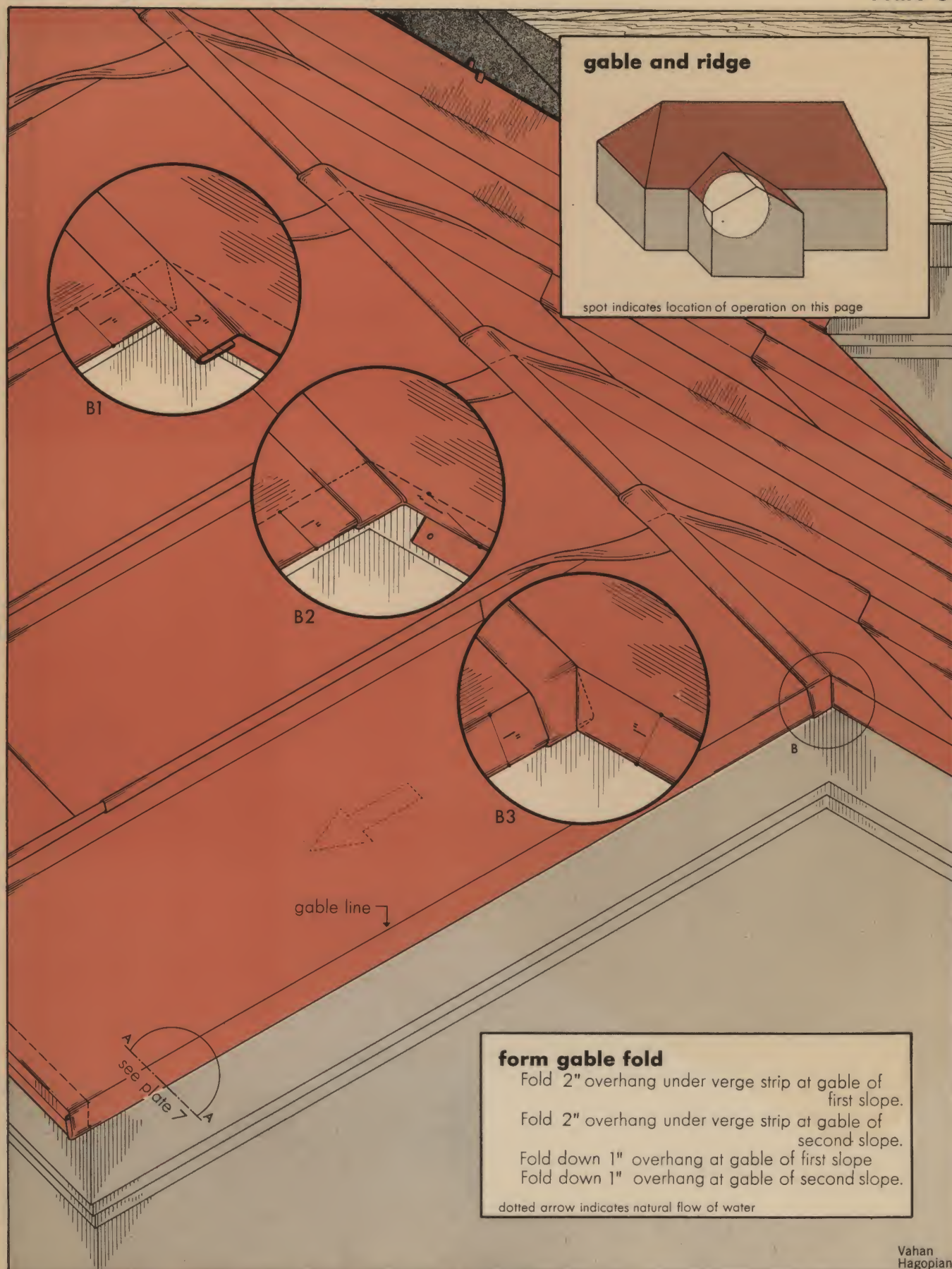
- Form standing seams, see plate 4.
- Flatten seam ends at ridge.
- Complete ridge, see plates 59 to 61.
- Flatten seam ends at eave to right or left and cut off surplus metal.
- Fold $\frac{3}{4}$ " overhang at eave to formed strip.

dotted arrow indicates natural flow of water

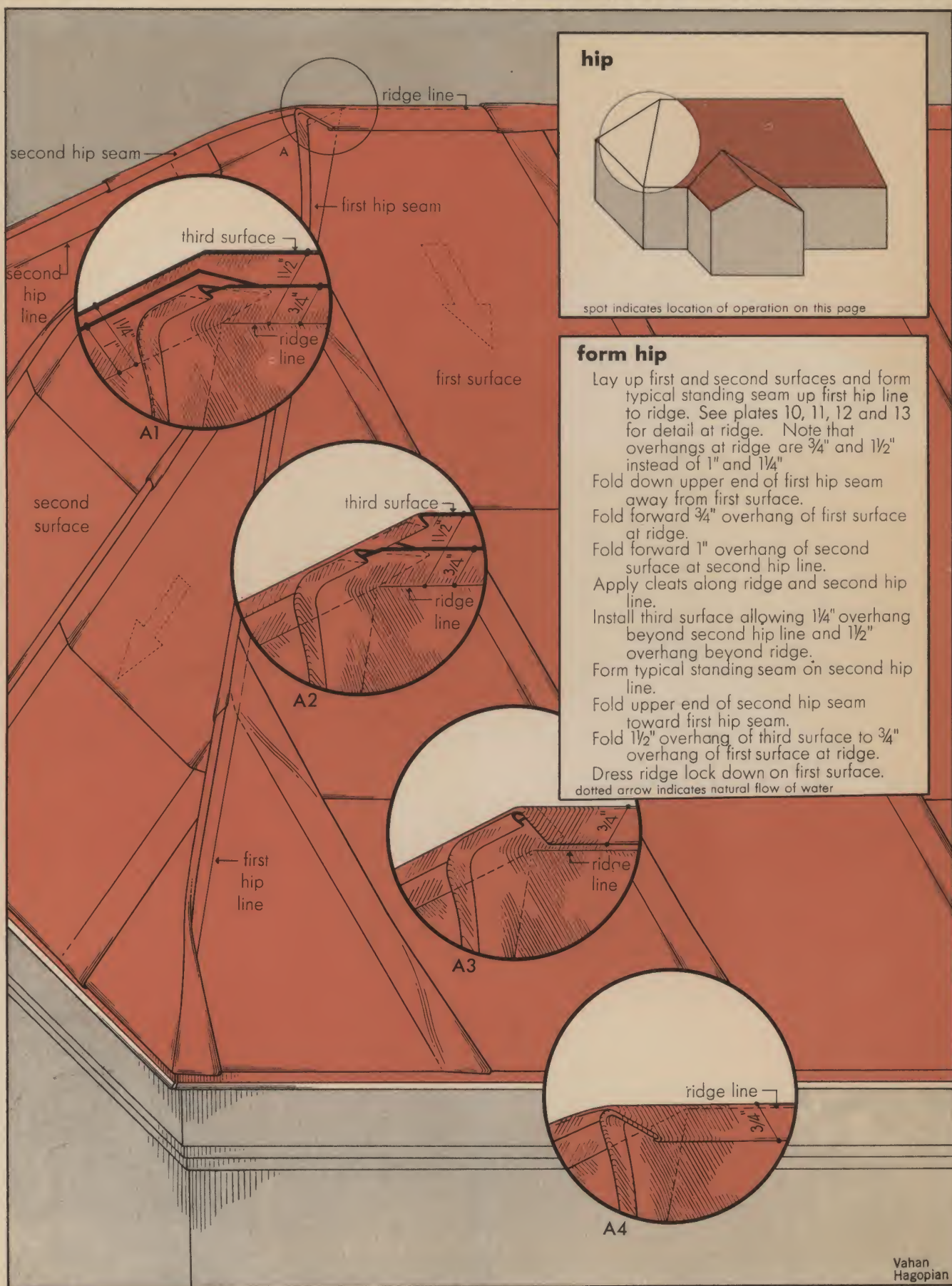
Vahan
Hagopian

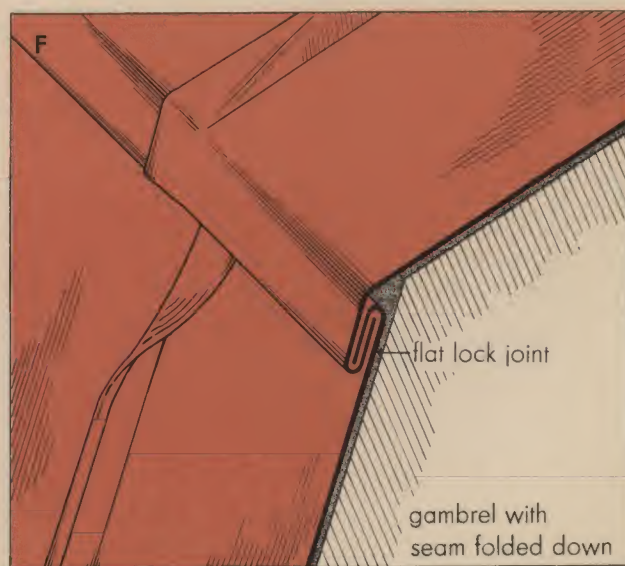
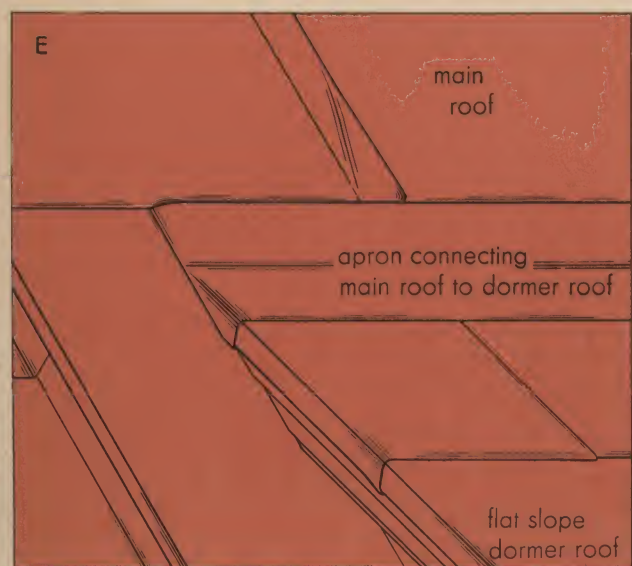
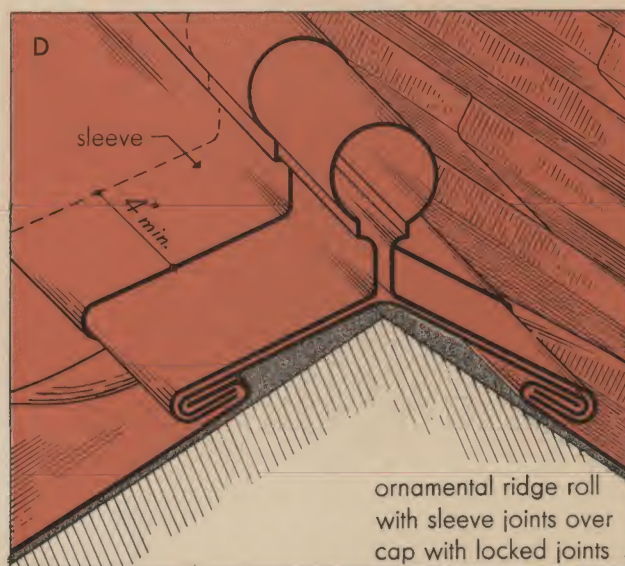
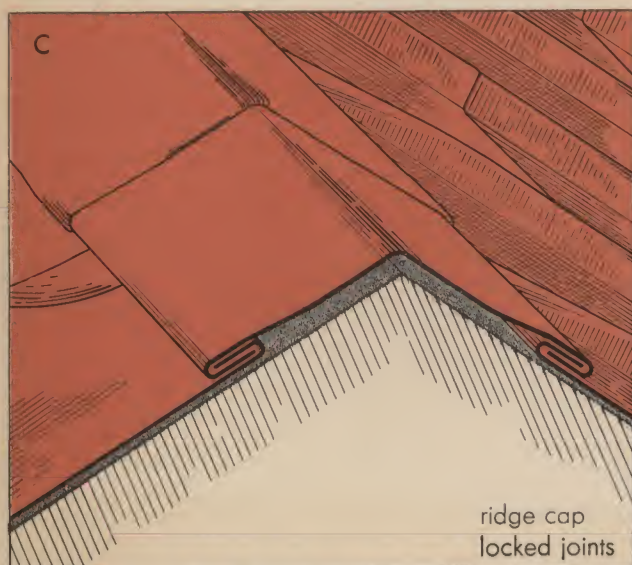
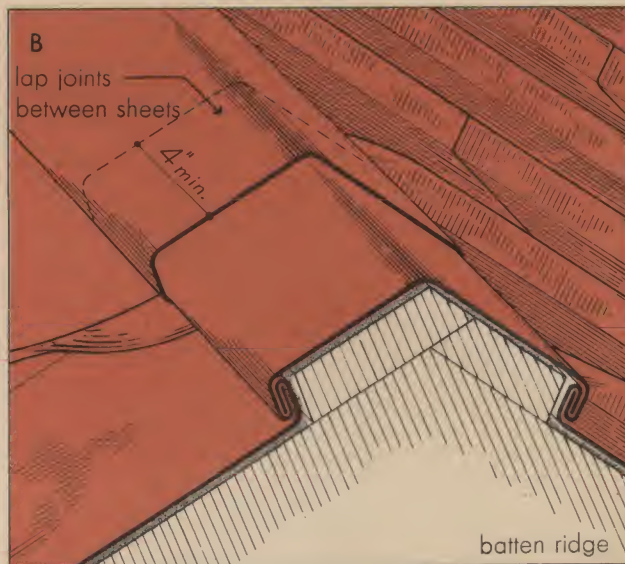
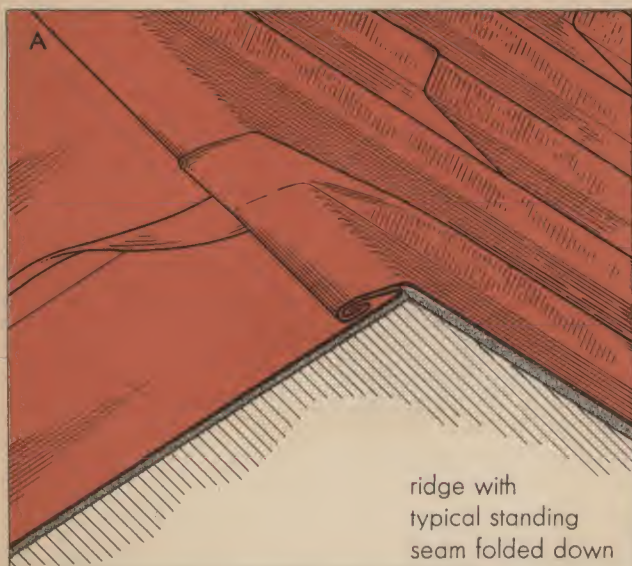


See plates 5, 6, 7, 8, and 9 in connection with plates 59, 60 and 61

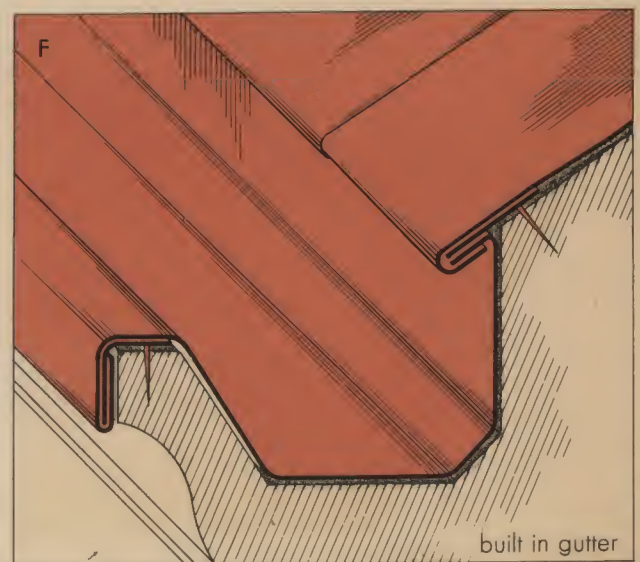
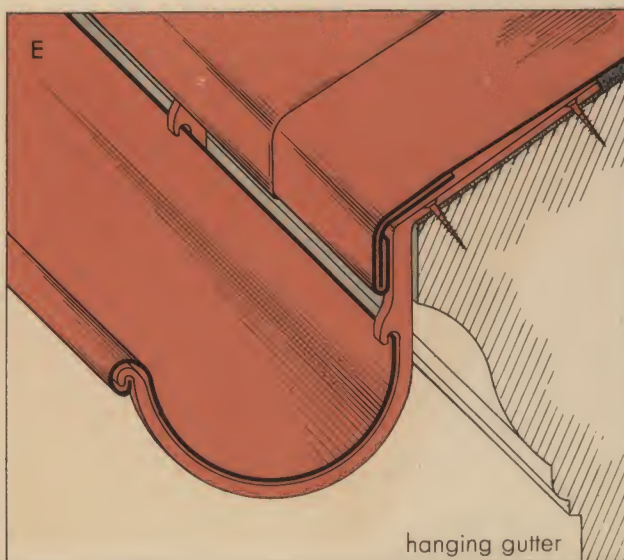
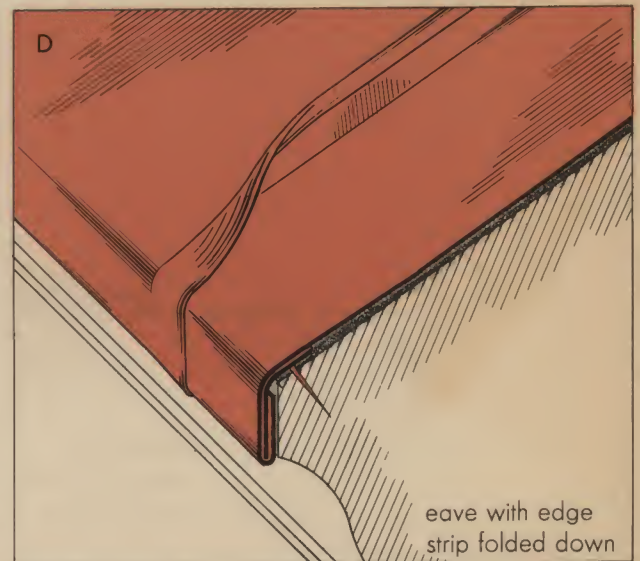
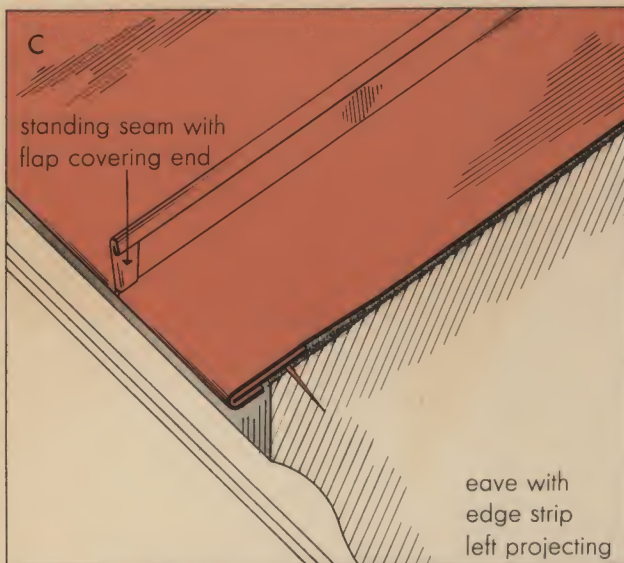
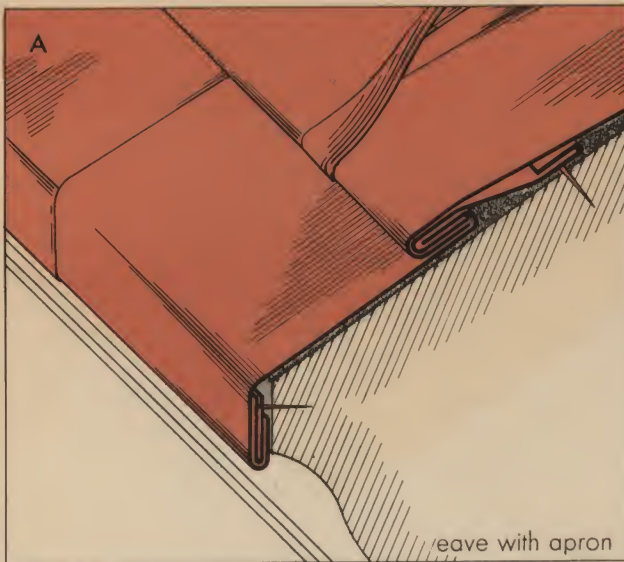


See plates 5, 6, 7, 8, and 9 in connection with plates 59, 60 and 61



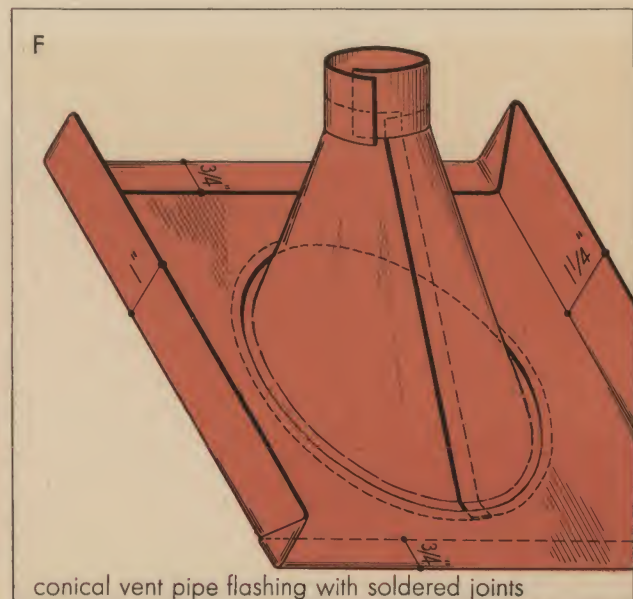
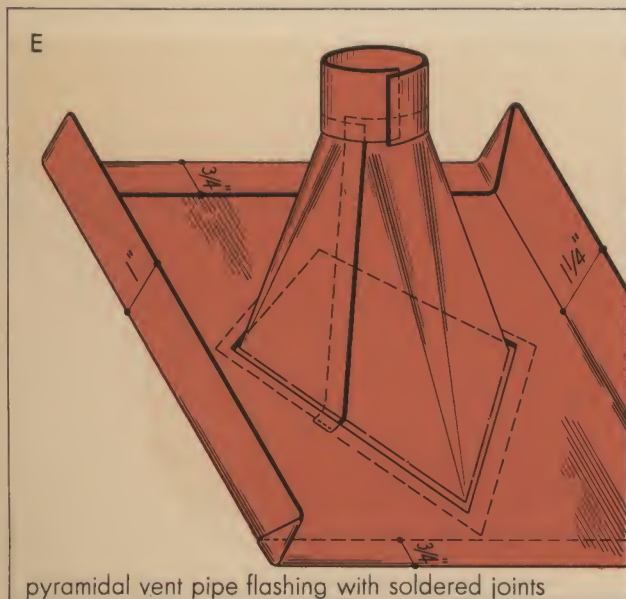
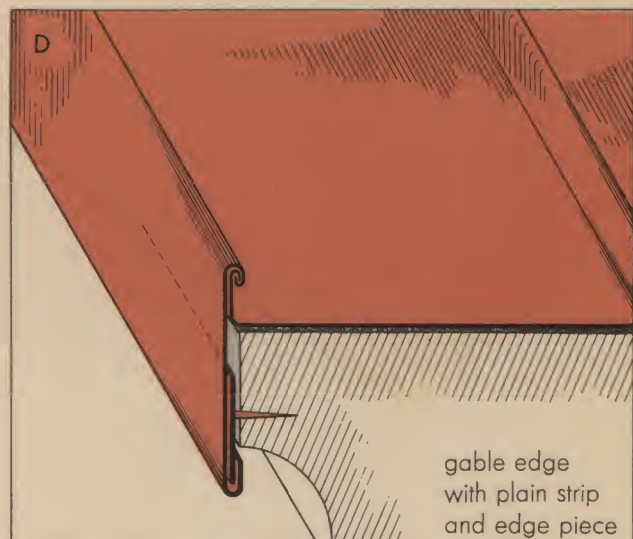
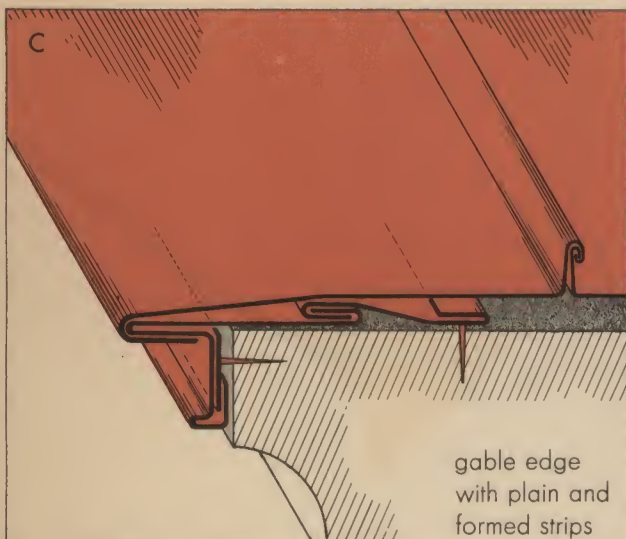
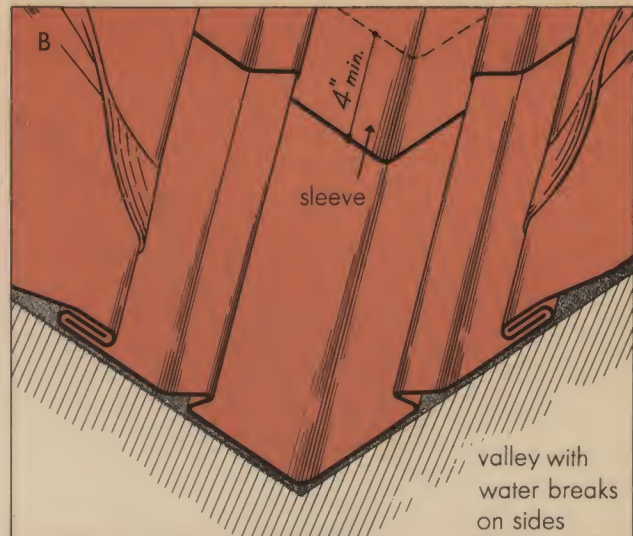
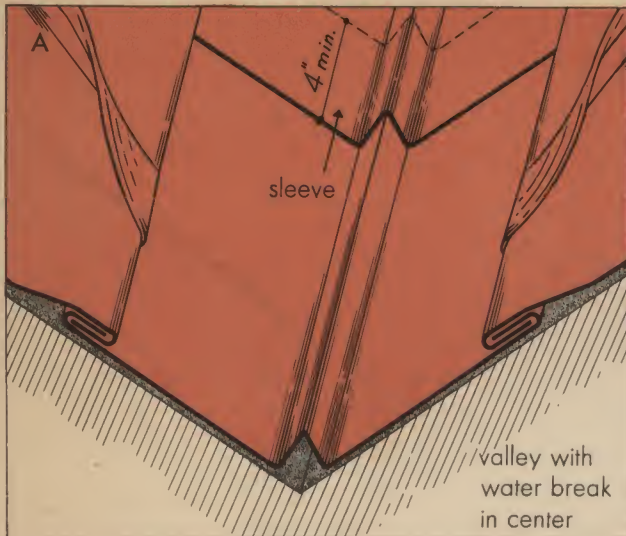


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additional and alternate copper roofing details



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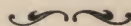
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